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<120> Polyketides and their synthesis

<130> IS/BP5858469

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<141> 2001-11-28

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<151> 2000-05-30

<150> GB 9912563.5

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<170> PatentIn Ver. 2.1

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 His Ala Gln Asn Arg Ile Pro Ser Pro Ala Val Arg Met Pro Leu Leu
 275 280 285
 Ala Ala Ser Ala Asp Ser Val Arg Arg Ala Ala Pro Leu Ala Ala Ser
 290 295 300
 Arg Lys
 305

<210> 7
 <211> 313
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 7
 Met Leu Asp Val Arg Arg Leu His Leu Leu Arg Glu Leu Asp Arg Arg
 1 5 10 15

Gly Thr Ile Ala Ala Val Ala Glu Ala Leu Thr Phe Thr Ala Ser Ala
 20 25 30
 Val Ser Gln Gln Leu Gly Val Leu Glu Arg Glu Ala Gly Val Pro Leu
 35 40 45
 Leu Glu Arg Ser Gly Arg Arg Val Val Leu Thr Pro Ala Gly Arg Ser
 50 55 60
 Leu Val Ala His Ala Asp Ala Val Leu Asn Arg Leu Glu Gln Ala Val
 65 70 75 80
 Ala Glu Leu Ala Gly Ala Arg Asp Gly Ile Gly Gly Pro Leu Arg Ile
 85 90 95
 Gly Thr Phe Pro Ser Gly Gly His Thr Ile Val Pro Gly Ala Leu Ala
 100 105 110
 Glu Leu Ala Ser Arg His Pro Ala Leu Glu Pro Met Val Arg Glu Ile
 115 120 125
 Asp Ser Ala Arg Val Ser Asp Gly Leu Arg Ala Gly Glu Leu Asp Val
 130 135 140
 Ala Leu Val His Asp Tyr Asp Phe Val Pro Ala Thr Pro Asp Thr Thr
 145 150 155 160
 Val Asp Glu Val Pro Leu Leu Glu Glu Pro Met Tyr Leu Val Thr His
 165 170 175
 Ala Ala Asp Thr Ala Thr Asp Ser Gly Ser Gly Ser Thr Leu Ala Ala
 180 185 190
 Leu Leu Gly Pro Cys Ala Glu Val Pro Trp Ile Thr Ala Arg Asp Gly
 195 200 205
 Thr Thr Gly His Ala Met Ala Val Arg Ala Cys Gln Ala Ala Gly Phe
 210 215 220
 Gln Pro Arg Ile Arg His Gln Val Asn Asp Phe Arg Thr Val Leu Ala
 225 230 235 240
 Leu Val Ala Ala Gly Gln Gly Ala Gly Phe Val Pro Arg Met Ala Ala
 245 250 255
 Glu Pro Ser Pro Ala Gly Val Val Leu Thr Lys Leu Pro Leu Phe Arg
 260 265 270
 Arg Ser Lys Val Ala Phe Arg Ala Gly Gly Gly Ala His Pro Ala Ile
 275 280 285
 Ala Ala Phe Val Ala Ala Ala Thr Thr Ala Val Glu Arg Met Ala Gly
 290 295 300
 Ser Arg Gly Pro Ala Gly Gly Ser Glu
 305 310

<210> 8
 <211> 138
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 8

Met Ala Asp Asp Ala Tyr Leu Phe Leu Leu Pro Asp Arg His Pro Arg
1 5 10 15
Leu Gly Ala Ala Leu Ala Ala Val Gly Ala Leu Glu Cys Thr Glu Thr
20 25 30
Pro Ala Val His Ala Trp Leu Gln Ala His Glu Ala Ser Val Ser Ser
35 40 45
Glu Gln Val Arg Ile Leu Pro Ala Asp Ala Glu Thr Leu Ile Pro Lys
50 55 60
Asp Ala Glu Arg Leu Pro Val Pro Leu Ser Glu Glu Glu Ala Leu Lys
65 70 75 80
Val Glu Gln Glu Cys Ala Pro Gln Thr Val Thr Asp Met Glu Ser Glu
85 90 95
Leu Leu Ala Phe Arg Glu Thr Thr Gln Asp Trp Gln Ala Leu Val His
100 105 110
Arg Ala Leu Thr Ala Gly Ile Pro Ala Gln Arg Ile Ala Arg Leu Thr
115 120 125
Gly Leu Asp Pro Glu Glu Ile Gly Arg Leu
130 135

<210> 9

<211> 207

<212> PRT

<213> Streptomyces cinnamonensis

<400> 9

Leu Ala Val Ala Ala Cys Ala Ala Val Val Leu Pro Ile Asp Ala Val
1 5 10 15
Val Arg Ile Ser Ala Ala Asp Val Gly Val Leu Val Phe Phe Ala Tyr
20 25 30
Leu Leu Pro Tyr Leu Ala Ile Thr Met Thr Val Phe Val Ser Val Ala
35 40 45
Pro Glu Gln Val Arg Ser Trp Ala Arg Arg Glu Ala Arg Gly Thr Phe
50 55 60
Leu Gln Arg Tyr Val Leu Gly Thr Ala Pro Gly Pro Gly Gly Ser Leu
65 70 75 80
Phe Ile Ala Ala Ala Ala Leu Val Val Ala Val Leu Trp Leu Pro Gly
85 90 95
His Leu Ser Thr Thr Phe Ser Ala Leu Pro Arg Thr Leu Val Ala Leu
100 105 110
Ala Leu Val Val Ala Ala Trp Ile Cys Val Val Val Ala Phe Ala Val
115 120 125
Thr Phe Gln Ala Asp Asn Leu Val Glu Asn Glu Arg Ala Leu Glu Phe
130 135 140
Pro Gly Glu Arg Ser Pro Ala Trp Ala Asp Tyr Val Tyr Phe Ala Leu
145 150 155 160

Ala Ala Met Thr Thr Phe Gly Thr Thr Asp Val Asp Val Thr Ser Arg
165 170 175

Asp Met Arg Arg Thr Val Ala Ala Asn Thr Val Ile Ala Phe Val Phe
180 185 190

Asn Thr Val Thr Val Ala Ile Leu Val Ser Ala Leu Gly Gly Arg
195 200 205

<210> 10

<211> 62

<212> PRT

<213> Streptomyces cinnamonensis

<400> 10

Met Thr Val Met Asp Lys Leu Lys Gln Met Leu Lys Gly His Glu Asp
1 5 10 15

Lys Ala Gly Gln Gly Ile Asp Lys Ala Gly Asp Phe Val Asp Gly Lys
20 25 30

Thr Gln Gly Lys Tyr Ser Gly Gln Val Asp Thr Ala Gln Asp Lys Leu
35 40 45

Arg Asp Gln Phe Gly Ser Asp Gln Gln Glu Pro Pro Gln Arg
50 55 60

<210> 11

<211> 184

<212> PRT

<213> Streptomyces cinnamonensis

<400> 11

Met Gly Thr Ala Gln Ser Gln Glu Gln Ala Ala Ala Pro Gly Ala Cys
1 5 10 15

Ala Ala Phe Val Arg Phe Val Leu Cys Gly Gly Gly Val Gly Leu Ala
20 25 30

Ser Ser Phe Ala Val Val Ala Leu Ala Ser Trp Val Pro Trp Ala Leu
35 40 45

Ala Asn Ala Leu Val Ala Val Val Ser Thr Val Val Ala Thr Glu Leu
50 55 60

His Ala Arg Phe Thr Phe Gly Ala Gly Gly Arg Ala Thr Trp Arg Gln
65 70 75 80

His Ala Gln Ser Ala Gly Ser Ala Ala Ala Tyr Ala Val Thr Cys
85 90 95

Val Ala Met Phe Val Leu Gln Gln Leu Val Ala Ala Pro Gly Ala Val
100 105 110

Leu Glu Gln Val Val Tyr Leu Ser Ala Ser Ala Leu Ala Gly Val Ala
115 120 125

Arg Phe Val Val Leu Arg Leu Val Val Phe Ala Arg Asn Arg Ser Leu
130 135 140

Pro Ala Ala Ala Ala Val Arg Thr Ala Arg Pro Val Arg Arg Val Pro
145 150 155 160

Ala Pro Val Pro Ala Thr Val Ala His Ala Ala Ser Arg Pro Ala Gly
165 170 175

Pro Ala Ala Leu Cys Pro Ala Ala
180

<210> 12
<211> 105
<212> PRT
<213> Streptomyces cinnamomensis

<400> 12
Met Thr Ser Thr Asp His Thr Ser Gly Gln Asp Ala Thr Glu Leu Glu
1 5 10 15
Lys Gln Leu Ala Ala Ala Thr Pro Glu Glu Arg Glu Lys Leu Leu Thr
20 25 30
Asp Thr Ile Arg Thr Gln Ala Gly Thr Leu Leu Asn Thr Thr Leu Ser
35 40 45
Asp Asp Ser Asn Phe Leu Glu Asn Gly Leu Asn Ser Leu Thr Ala Leu
50 55 60
Glu Leu Thr Lys Thr Leu Met Thr Leu Thr Gly Met Glu Ile Ala Met
65 70 75 80
Val Ala Ile Val Glu Asn Pro Thr Pro Ala Gln Leu Ala His His Leu
85 90 95
Gly Gln Glu Leu Ala His Thr Thr Ala
100 105

<210> 13
<211> 828
<212> PRT
<213> Streptomyces cinnamomensis

<400> 13
Val Ala Asn Glu Glu Lys Leu Val Glu Tyr Leu Lys Trp Thr Thr Ala
1 5 10 15
Glu Leu His Gln Ala Gln Gln Gln Leu Arg Glu Leu Lys Ala Ala Gln
20 25 30
His Glu Pro Ile Ala Val Val Ser Met Ala Cys Arg Leu Pro Gly Lys
35 40 45
Thr Arg Thr Pro Asp Asp Leu Trp Asp Leu Val Ser Glu Gly Arg Asp
50 55 60
Ala Val Thr Gly Phe Pro Asp Asp Arg Ala Trp Glu Leu Pro Glu Glu
65 70 75 80
Arg Pro Tyr Ala Glu Leu Gly Gly Phe Leu Asp Asp Ala Ala Gly Phe
85 90 95
Asp Ala Gly Phe Phe Asp Ile Ser Asp Thr Glu Ala Val Ala Thr Glu
100 105 110
Pro Leu Gln Arg Leu Met Leu His Leu Ala Trp Glu Thr Val Glu Arg
115 120 125

Gly	His	Ile	Ala	Pro	His	Thr	Leu	Arg	Ser	Thr	Leu	Thr	Gly	Val	Tyr	130	135	140
Val	Gly	Ala	Thr	Gly	His	Asp	Tyr	Ala	Thr	Arg	Leu	Glu	Thr	Ala	Pro	145	150	155
Asp	Glu	Leu	Leu	Pro	Tyr	Leu	Gly	Gly	Gly	Thr	Ser	Gly	Ser	Leu	Val	165	170	175
Ser	Gly	Arg	Ile	Ala	Tyr	Ala	Leu	Gly	Leu	Glu	Gly	Pro	Ala	Ile	Ser	180	185	190
Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala	Cys	195	200	205
Gln	Ala	Leu	Arg	Arg	Gly	Glu	Cys	Gly	Leu	Ala	Leu	Ala	Gly	Gly	Gly	210	215	220
Thr	Val	Met	Ser	Thr	Pro	His	Thr	Phe	His	Ala	Phe	Ala	His	Gln	Lys	225	230	235
Ser	Leu	Ala	Gln	Asp	Gly	Arg	Cys	Lys	Pro	Phe	Ala	Ala	Ala	Ala	Asp	245	250	255
Gly	Met	Gly	Leu	Gly	Glu	Gly	Val	Gly	Leu	Val	Leu	Leu	Glu	Arg	Leu	260	265	270
Gly	Asp	Ala	Arg	Lys	Asn	Gly	His	Pro	Val	Leu	Ala	Val	Ile	Arg	Gly	275	280	285
Ser	Ala	Val	Asn	Gln	Asp	Gly	Ala	Gly	Tyr	Gly	Leu	Ala	Ala	Pro	Asn	290	295	300
Gly	Pro	Ser	Gln	Gln	His	Val	Ile	Arg	Ala	Ala	Leu	Ala	Asp	Ala	Gly	305	310	315
Leu	Thr	Pro	Asp	Gln	Ile	Asp	Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	325	330	335
Pro	Ile	Gly	Asp	Ala	Ile	Glu	Val	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	340	345	350
Ala	Asp	Arg	Ser	Pro	Asp	Arg	Pro	Leu	Trp	Leu	Gly	Ser	Val	Lys	Ser	355	360	365
Asn	Thr	Gly	His	Thr	Gln	Gly	Ala	Ala	Gly	Ala	Ala	Ala	Leu	Ile	Lys	370	375	380
Met	Val	Gln	Ala	Phe	Arg	His	Gly	Thr	Leu	Pro	Pro	Thr	Leu	His	Val	385	390	395
Asp	Arg	Pro	Thr	Pro	Leu	Ala	Ala	Trp	Lys	Lys	Gly	Ala	Val	Arg	Leu	405	410	415
Leu	Thr	Glu	Ala	Val	Asp	Trp	Pro	Arg	Arg	Glu	Glu	Pro	Arg	Arg	Val	420	425	430
Gly	Ile	Ser	Ala	Phe	Ala	Thr	Ser	Gly	Thr	Asn	Ala	His	Leu	Ile	Leu	435	440	445
Glu	Glu	Pro	Pro	Val	Asp	Glu	Ala	Pro	Val	Pro	Asp	Ala	Ala	Arg	Asp	450	455	460
Gln	Thr	Ser	Pro	Val	Ala	Pro	Glu	Leu	Pro	Val	Ala	Trp	Ser	Leu	Ser	465	470	475

Ala	Arg	Thr	Pro	Glu	Ala	Leu	Arg	Ala	Gln	Ala	Lys	Ala	Leu	Val	Thr	485	490	495
His	Leu	Ala	Ala	Thr	Asp	Pro	Ala	Pro	Ser	Pro	Ala	Glu	Val	Ala	Tyr	500	505	510
Ser	Leu	Ala	Ala	Thr	Arg	Ser	Pro	Leu	Glu	His	Arg	Ala	Val	Leu	Thr	515	520	525
Gly	Thr	Asp	His	Thr	Glu	Leu	Leu	Ala	Ala	Ala	Arg	Ala	Leu	Ala	Ala	530	535	540
Gly	Glu	Asp	His	Pro	Asp	Leu	Val	Arg	Ser	Thr	Pro	Gly	Ala	Gly	Pro	545	550	555
Lys	Lys	Ile	Ala	Trp	His	Phe	Asp	Gly	Arg	Pro	Ala	Asp	Gly	Val	Thr	565	570	575
Thr	Gly	Ala	Ala	Pro	Gly	Ala	Lys	Pro	Gly	Ala	Thr	Phe	Gly	Ala	Thr	580	585	590
Phe	Gly	Ala	Ala	Phe	Gly	Gly	Ala	Glu	Phe	His	Ser	Ala	Phe	Pro	Leu	595	600	605
Phe	Ala	Ser	Ala	Phe	Asp	Glu	Ala	Arg	Ala	Leu	Leu	Asp	Thr	His	Leu	610	615	620
Pro	Thr	Pro	Leu	Pro	Thr	Pro	His	Ser	Glu	Leu	Ala	Arg	Phe	Ala	Val	625	630	635
His	Thr	Ala	Leu	Ala	Arg	Leu	Leu	Leu	Glu	Thr	Gly	Val	Arg	Pro	His	645	650	655
Thr	Leu	Thr	Gly	Asp	Gly	Val	Gly	His	Ile	Ala	Ala	Ala	Tyr	Ala	Ala	660	665	670
Gly	Ile	Leu	Thr	Leu	Asp	Asp	Ala	Cys	Arg	Leu	Ala	Ala	Ala	His	Ala	675	680	685
Ala	Ala	Ala	Gln	Ala	Ala	Glu	Gly	Glu	Gln	Pro	Ala	Pro	Pro	Asp	Ala	690	695	700
Tyr	Glu	Pro	Val	Leu	Lys	Gln	Leu	Thr	Phe	Gln	Arg	Ala	Thr	Leu	Thr	705	710	715
Leu	Thr	Ser	Thr	Ala	Pro	Ala	Asp	Thr	Pro	Ile	Ala	Ser	Ala	Asp	Tyr	725	730	735
Trp	His	His	His	Leu	Thr	Ser	Pro	Ala	Pro	Thr	Ala	Pro	Pro	Thr	Pro	740	745	750
Glu	Thr	His	Thr	Leu	Leu	His	Leu	Gly	Ala	Leu	Ser	Pro	Glu	Gly	Thr	755	760	765
Gln	Thr	Ser	Ala	Val	Ser	Ala	Leu	Leu	Thr	Ala	Leu	Ala	Arg	Leu	His	770	775	780
Thr	Thr	Gly	Gly	Thr	Val	Asp	Trp	Thr	Pro	Leu	Val	Arg	Arg	Thr	Pro	785	790	795
His	Pro	Arg	Thr	Ile	Asp	Leu	Pro	Thr	Tyr	Ser	Phe	Gln	Ala	Thr	Arg	805	810	815
Tyr	Trp	Leu	His	Asp	His	Thr	Ala	His	Ala	Ala	Val					820	825	

<210> 15
 <211> 276
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 15
 Val Asn Lys Thr Val Ala Pro Glu Pro Ser Asp Ile Gly His Tyr Tyr
 1 5 10 15
 Asp His Lys Val Phe Asp Leu Met Thr Gln Leu Gly Asp Gly Asn Leu
 20 25 30
 His Tyr Gly Tyr Trp Phe Asp Gly Gly Glu Gln Gln Ala Thr Phe Asp
 35 40 45
 Glu Ala Met Val Gln Met Thr Asp Glu Met Ile Arg Arg Leu Asp Pro
 50 55 60
 Ala Pro Gly Asp Arg Val Leu Asp Ile Gly Cys Gly Asn Gly Thr Pro
 65 70 75 80
 Ala Met Gln Leu Ala Arg Ala Arg Asp Val Glu Val Val Gly Ile Ser
 85 90 95
 Val Ser Ala Arg Gln Val Glu Arg Gly Asn Arg Arg Ala Arg Glu Ala
 100 105 110
 Gly Leu Ala Asp Arg Val Arg Phe Glu Gln Val Asp Ala Met Asn Leu
 115 120 125
 Pro Phe Asp Asp Gly Ser Phe Asp His Cys Trp Ala Leu Glu Ser Met
 130 135 140
 Leu His Met Pro Asp Lys Gln Gln Val Leu Thr Glu Ala His Arg Val
 145 150 155 160
 Val Lys Pro Gly Ala Arg Met Pro Ile Ala Asp Met Val Tyr Leu Asn
 165 170 175
 Pro Asp Pro Ser Arg Pro Arg Thr Ala Thr Val Ser Asp Thr Thr Ile
 180 185 190
 Tyr Ala Ala Leu Thr Asp Ile Gly Asp Tyr Pro Asp Ile Phe Arg Ala
 195 200 205
 Ala Gly Trp Thr Val Leu Glu Leu Thr Asp Ile Thr Arg Glu Thr Ala
 210 215 220
 Lys Thr Tyr Asp Gly Tyr Val Glu Trp Ile Arg Ala His Arg Asp Glu
 225 230 235 240
 Tyr Val Asp Ile Ile Gly Val Glu Gly Tyr Glu Leu Phe Leu His Asn
 245 250 255
 Gln Ala Ala Leu Gly Lys Met Pro Glu Leu Gly Tyr Ile Phe Ala Thr
 260 265 270
 Ala Gln Arg Pro
 275

<210> 16
 <211> 511
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 16
 Met Ser Ala Asp Leu Gly Ala Arg Arg Trp Trp Ala Val Gly Ala Leu
 1 5 10 15
 Val Leu Ala Ser Met Val Val Gly Phe Asp Val Thr Ile Leu Ser Leu
 20 25 30
 Ala Leu Pro Ala Met Ala Asp Asp Leu Gly Ala Asn Asn Val Glu Leu
 35 40 45
 Gln Trp Phe Val Thr Ser Tyr Thr Leu Val Phe Ala Ala Gly Met Ile
 50 55 60
 Pro Ala Gly Met Leu Gly Asp Arg Phe Gly Arg Lys Lys Val Leu Leu
 65 70 75 80
 Thr Ala Leu Val Ile Phe Gly Ile Ala Ser Leu Ala Cys Ala Tyr Ala
 85 90 95
 Thr Ser Ser Gly Thr Phe Ile Gly Ala Arg Ala Val Leu Gly Leu Gly
 100 105 110
 Ala Ala Leu Ile Met Pro Thr Thr Leu Ser Leu Leu Pro Val Met Phe
 115 120 125
 Ser Asp Glu Glu Arg Pro Lys Ala Ile Gly Ala Val Ala Gly Ala Ala
 130 135 140
 Met Leu Ala Tyr Pro Leu Gly Pro Ile Leu Gly Gly Tyr Leu Leu Asn
 145 150 155 160
 His Phe Trp Trp Gly Ser Val Phe Leu Ile Asn Val Pro Val Val Ile
 165 170 175
 Leu Ala Phe Leu Ala Val Ser Ala Trp Leu Pro Glu Ser Lys Ala Lys
 180 185 190
 Glu Ala Lys Pro Phe Asp Ile Gly Gly Leu Val Phe Ser Ser Val Gly
 195 200 205
 Leu Ala Ala Leu Thr Tyr Gly Val Ile Gln Gly Gly Glu Lys Gly Trp
 210 215 220
 Thr Asp Val Thr Thr Leu Val Pro Cys Ile Gly Gly Leu Leu Ala Leu
 225 230 235 240
 Val Leu Phe Val Met Trp Glu Lys Arg Val Ala Asp Pro Leu Val Asp
 245 250 255
 Leu Ser Leu Phe Arg Ser Ala Arg Phe Thr Ser Gly Thr Met Leu Gly
 260 265 270
 Thr Val Ile Asn Phe Thr Met Phe Gly Val Leu Phe Thr Met Pro Gln
 275 280 285
 Tyr Tyr Gln Ala Val Leu Gly Thr Asp Ala Met Gly Ser Gly Phe Arg
 290 295 300
 Leu Leu Pro Met Val Gly Gly Leu Leu Val Gly Val Thr Val Ala Asn
 305 310 315 320
 Lys Val Ala Lys Ala Leu Gly Pro Lys Thr Ala Val Gly Ile Gly Phe
 325 330 335

Ala Leu Leu Ala Ala Ala Leu Phe Tyr Gly Ala Thr Thr Asp Val Ser
 340 345 350
 Ser Gly Thr Gly Leu Ala Ala Ala Trp Thr Ala Ala Tyr Gly Leu Gly
 355 360 365
 Leu Gly Ile Ala Leu Pro Thr Ala Met Asp Ala Ala Leu Gly Ala Leu
 370 375 380
 Ser Glu Asp Ser Ala Gly Val Gly Ser Gly Val Asn Gln Ser Ile Arg
 385 390 395 400
 Thr Leu Gly Gly Ser Phe Gly Ala Ala Ile Leu Gly Ser Ile Leu Asn
 405 410 415
 Ser Gly Tyr Arg Gly Lys Leu Asp Leu Asp Gly Val Pro Glu Gln Ala
 420 425 430
 His Gly Ala Val Lys Asp Ser Val Phe Gly Gly Leu Ala Val Ala Arg
 435 440 445
 Ala Ile Lys Ser Asn Gly Leu Ala Asp Ser Val Arg Ser Ala Tyr Val
 450 455 460
 His Ala Leu Asp Val Val Leu Val Val Ser Gly Gly Leu Gly Leu Leu
 465 470 475 480
 Gly Val Val Leu Ala Val Val Trp Leu Pro Arg His Val Gly Gln Ser
 485 490 495
 Thr Ala Lys Thr Ala Glu Ser Glu His Glu Ala Ala Asp Ala Val
 500 505 510

<210> 17

<211> 191

<212> PRT

<213> *Streptomyces cinnamomensis*

<400> 17

Val Pro Gly Leu Arg Glu Arg Lys Lys Ala Arg Thr Lys Ala Ala Ile
 1 5 10 15
 Gln Arg Glu Ala Val Arg Leu Phe Arg Glu Gln Gly Tyr Thr Ala Thr
 20 25 30
 Thr Ile Glu Gln Ile Ala Glu Ala Ala Glu Val Ala Pro Ser Thr Val
 35 40 45
 Phe Arg Tyr Phe Ala Thr Lys Gln Asp Leu Val Phe Ser His Asp Tyr
 50 55 60
 Asp Leu Pro Phe Ala Met Met Val Gln Ala Gln Ser Pro Asp Leu Thr
 65 70 75 80
 Pro Ile Gln Ala Glu Arg Gln Ala Ile Arg Ser Met Leu Gln Asp Ile
 85 90 95
 Ser Glu Gln Glu Leu Ala Leu Gln Arg Glu Arg Phe Val Leu Ile Leu
 100 105 110
 Ser Glu Pro Glu Leu Trp Gly Ala Ser Leu Gly Asn Ile Gly Gln Thr
 115 120 125

Met Gln Ile Met Ser Glu Gln Val Ala Lys Arg Ala Gly Arg Asp Pro
 130 135 140

Arg Asp Pro Ala Val Arg Ala Tyr Thr Gly Ala Val Phe Gly Val Met
 145 150 155 160

Leu Gln Val Ser Met Asp Trp Ala Asn Asp Pro Asp Met Asp Phe Ala
 165 170 175

Thr Thr Leu Asp Glu Ala Leu His Tyr Leu Glu Asp Leu Arg Pro
 180 185 190

<210> 18
 <211> 268
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 18
 Met Asp Arg Gly Thr Ala Ala Arg Ala Pro Gln Ile Gly Asp Glu Phe
 1 5 10 15

Gly Ala Ala Thr Gly Asn Gly Val Trp Leu Arg Arg Tyr His Ala Ala
 20 25 30

Ala Glu Ala Pro Val Arg Leu Val Cys Phe Pro Phe Ala Gly Gly Ser
 35 40 45

Ala Ser Tyr Tyr Phe Gly Leu Ser Gly Leu Leu Ala Pro Gly Val Glu
 50 55 60

Val Leu Ala Val Gln Tyr Pro Gly Arg Gln Asp Arg His Ala Glu Pro
 65 70 75 80

Cys Leu Ala Ser Val Ala Glu Leu Ala Asp Gly Val Val Pro His Leu
 85 90 95

Pro Cys Asp Gly Lys Pro Phe Ala Leu Phe Gly His Ser Leu Gly Ala
 100 105 110

Ile Val Ala Phe Glu Val Ala Arg Arg Leu Arg Gly Pro Ala Gly Pro
 115 120 125

Gly Leu Pro Val His Leu Phe Val Ser Gly Gly Leu Ala Arg Pro Tyr
 130 135 140

Arg Pro Ala Gly Arg Ser Gly Ala Phe Gly Asp Ala Asp Ile Leu Ala
 145 150 155 160

His Leu Arg Ala Met Gly Gly Thr Asp Glu Arg Phe Phe Arg Ser Pro
 165 170 175

Glu Leu Gln Glu Leu Val Leu Pro Ala Leu Arg Ala Asp Tyr Arg Ala
 180 185 190

Val Ala Thr Tyr Glu Ala Pro Gly Pro Gly Arg Leu Asp Cys Pro Ile
 195 200 205

Thr Ala Leu Ile Gly Asp Ala Asp Glu Arg Thr Ser Pro Glu Gln Ala
 210 215 220

Ala Thr Trp Arg Glu Arg Thr Gly Ala Ala Phe Asp Leu Arg Val Leu
 225 230 235 240

Pro Gly Gly His Phe Tyr Leu Asp Gly Cys Gln Glu Gln Val Ala Ala
245 250 255

Val Val Thr Glu Ala Leu Thr Ala Gly Pro Gly Val
260 265

<210> 19

<211> 3025

<212> PRT

<213> *Streptomyces cinnamomensis*

<400> 19

Met Ala Ala Ser Ala Ser Ala Ser Pro Ser Gly Pro Ser Ala Gly Pro
1 5 10 15

Asp Pro Ile Ala Val Val Gly Met Ala Cys Arg Leu Pro Gly Ala Pro
20 25 30

Asp Pro Asp Ala Phe Trp Arg Leu Leu Ser Glu Gly Arg Ser Ala Val
35 40 45

Ser Thr Ala Pro Pro Glu Arg Arg Arg Ala Asp Ser Gly Leu His Gly
50 55 60

Pro Gly Gly Tyr Leu Asp Arg Ile Asp Gly Phe Asp Ala Asp Phe Phe
65 70 75 80

His Ile Ser Pro Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu
85 90 95

Leu Leu Glu Leu Ser Trp Glu Ala Leu Glu Asp Ala Gly Ile Arg Pro
100 105 110

Pro Thr Leu Ala Arg Ser Arg Thr Gly Val Phe Val Gly Ala Phe Trp
115 120 125

Asp Asp Tyr Thr Asp Val Leu Asn Leu Arg Ala Pro Gly Ala Val Thr
130 135 140

Arg His Thr Met Thr Gly Val His Arg Ser Ile Leu Ala Asn Arg Ile
145 150 155 160

Ser Tyr Ala Tyr His Leu Ala Gly Pro Ser Leu Thr Val Asp Thr Ala
165 170 175

Gln Ser Ser Ser Leu Val Ala Val His Leu Ala Cys Glu Ser Ile Arg
180 185 190

Ser Gly Asp Ser Asp Ile Ala Phe Ala Gly Gly Val Asn Leu Ile Cys
195 200 205

Ser Pro Arg Thr Thr Glu Leu Ala Ala Ala Arg Phe Gly Gly Leu Ser
210 215 220

Ala Ala Gly Arg Cys His Thr Phe Asp Ala Arg Ala Asp Gly Phe Val
225 230 235 240

Arg Gly Glu Gly Gly Gly Leu Val Val Leu Lys Pro Leu Ala Ala Ala
245 250 255

Arg Arg Asp Gly Asp Thr Val Tyr Cys Val Ile Arg Gly Ser Ala Val
260 265 270

Asn	Ser	Asp	Gly	Thr	Thr	Asp	Gly	Ile	Thr	Leu	Pro	Ser	Gly	Gln	Ala
		275					280					285			
Gln	Gln	Asp	Val	Val	Arg	Leu	Ala	Cys	Arg	Arg	Ala	Arg	Ile	Thr	Pro
	290					295					300				
Asp	Gln	Val	Gln	Tyr	Val	Glu	Leu	His	Gly	Thr	Gly	Thr	Pro	Val	Gly
305					310					315					320
Asp	Pro	Ile	Glu	Ala	Ala	Ala	Leu	Gly	Ala	Ala	Leu	Gly	Gln	Asp	Ala
				325					330					335	
Ala	Arg	Ala	Val	Pro	Leu	Ala	Val	Gly	Ser	Ala	Lys	Thr	Asn	Val	Gly
			340					345					350		
His	Leu	Glu	Ala	Ala	Ala	Gly	Ile	Val	Gly	Leu	Leu	Lys	Thr	Ala	Leu
		355					360					365			
Ser	Ile	His	His	Arg	Arg	Leu	Ala	Pro	Ser	Leu	Asn	Phe	Thr	Thr	Pro
	370					375					380				
Asn	Pro	Ala	Ile	Pro	Leu	Ala	Asp	Leu	Gly	Leu	Thr	Val	Gln	Gln	Asp
385					390					395					400
Leu	Ala	Asp	Trp	Pro	Arg	Pro	Glu	Gln	Pro	Leu	Ile	Ala	Gly	Val	Ser
				405					410					415	
Ser	Phe	Gly	Met	Gly	Gly	Thr	Asn	Gly	His	Val	Val	Val	Ala	Ala	Ala
			420					425					430		
Pro	Asp	Ser	Val	Ala	Val	Pro	Glu	Pro	Val	Gly	Val	Pro	Glu	Arg	Val
		435					440					445			
Glu	Val	Pro	Glu	Pro	Val	Val	Val	Ser	Glu	Pro	Val	Val	Val	Pro	Thr
	450					455					460				
Pro	Trp	Pro	Val	Ser	Ala	His	Ser	Ala	Ser	Ala	Leu	Arg	Ala	Gln	Ala
465					470					475					480
Gly	Arg	Leu	Arg	Thr	His	Leu	Ala	Ala	His	Arg	Pro	Thr	Pro	Asp	Ala
				485					490					495	
Ala	Arg	Val	Gly	His	Ala	Leu	Ala	Thr	Thr	Arg	Ala	Pro	Leu	Ala	His
			500					505					510		
Arg	Ala	Val	Leu	Leu	Gly	Gly	Asp	Thr	Ala	Glu	Leu	Leu	Gly	Ser	Leu
		515					520					525			
Asp	Ala	Leu	Ala	Glu	Gly	Ala	Glu	Thr	Ala	Ser	Ile	Val	Arg	Gly	Glu
	530					535					540				
Ala	Tyr	Thr	Glu	Gly	Arg	Thr	Ala	Phe	Leu	Phe	Ser	Gly	Gln	Gly	Ala
545					550					555					560
Gln	Arg	Leu	Gly	Met	Gly	Arg	Glu	Leu	Tyr	Ala	Val	Phe	Pro	Val	Phe
				565					570					575	
Ala	Asp	Ala	Leu	Asp	Glu	Ala	Phe	Ala	Ala	Leu	Asp	Val	His	Leu	Asp
			580					585					590		
Arg	Pro	Leu	Arg	Glu	Ile	Val	Leu	Gly	Glu	Thr	Asp	Ser	Gly	Gly	Asn
		595					600					605			
Val	Ser	Gly	Glu	Asn	Val	Ile	Gly	Glu	Gly	Ala	Asp	His	Gln	Ala	Leu
	610					615					620				

Leu Asp Gln Thr Ala Tyr Thr Gln Pro Ala Leu Phe Ala Ile Glu Thr
 625 630 635 640
 Ser Leu Tyr Arg Leu Ala Ala Ser Phe Gly Leu Lys Pro Asp Tyr Val
 645 650 655
 Leu Gly His Ser Val Gly Glu Ile Ala Ala Ala His Val Ala Gly Val
 660 665 670
 Leu Ser Leu Pro Asp Ala Ser Ala Leu Val Ala Thr Arg Gly Arg Leu
 675 680 685
 Met Gln Ala Val Arg Ala Pro Gly Ala Met Ala Ala Trp Gln Ala Thr
 690 695 700
 Ala Asp Glu Ala Ala Glu Gln Leu Ala Gly His Glu Arg His Val Thr
 705 710 715 720
 Val Ala Ala Val Asn Gly Pro Asp Ser Val Val Val Ser Gly Asp Arg
 725 730 735
 Ala Thr Val Asp Glu Leu Thr Ala Ala Trp Arg Gly Arg Gly Arg Lys
 740 745 750
 Ala His His Leu Lys Val Ser His Ala Phe His Ser Pro His Met Asp
 755 760 765
 Pro Ile Leu Asp Glu Leu Arg Ala Val Ala Ala Gly Leu Thr Phe His
 770 775 780
 Glu Pro Val Ile Pro Val Val Ser Asn Val Thr Gly Glu Leu Val Thr
 785 790 795 800
 Ala Thr Ala Thr Gly Ser Gly Ala Gly Gln Ala Asp Pro Glu Tyr Trp
 805 810 815
 Ala Arg His Ala Arg Glu Pro Val Arg Phe Leu Ser Gly Val Arg Gly
 820 825 830
 Leu Cys Glu Arg Gly Val Thr Thr Phe Val Glu Leu Gly Pro Asp Ala
 835 840 845
 Pro Leu Ser Ala Met Ala Arg Asp Cys Phe Pro Ala Pro Ala Asp Arg
 850 855 860
 Ser Arg Pro Arg Pro Ala Ala Ile Ala Thr Cys Arg Arg Gly Arg Asp
 865 870 875 880
 Glu Val Ala Thr Phe Leu Arg Ser Leu Ala Gln Ala Tyr Val Arg Gly
 885 890 895
 Ala Asp Val Asp Phe Thr Arg Ala Tyr Gly Ala Thr Ala Thr Arg Arg
 900 905 910
 Phe Pro Leu Pro Thr Tyr Pro Phe Gln Arg Glu Arg His Trp Pro Ala
 915 920 925
 Ala Ala Gly Val Gly Gln Gln Pro Glu Thr Pro Glu Leu Pro Glu Ser
 930 935 940
 Ser Glu Ser Ser Glu Gln Ala Gly His Glu Arg Glu Glu Gly Ala Arg
 945 950 955 960
 Ala Trp Gly Gly Pro Glu Gly Arg Leu Ala Gly Leu Ser Val Asn Asp
 965 970 975

Gln Glu Arg Val Leu Leu Gly Leu Val Thr Lys His Val Ala Val Val
 980 985 990
 Leu Gly Asp Ala Ser Gly Thr Val Gln Ala Ala Arg Thr Phe Lys Gln
 995 1000 1005
 Leu Gly Phe Asp Ser Met Ala Ala Ala Glu Leu Ser Glu Arg Leu Gly
 1010 1015 1020
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 1025 1030 1035 1040
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 1045 1050 1055
 Pro Ala Pro Ala Gly Ser Ala Pro Ala Thr Gly Ala Leu Gly Ala Gly
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 Arg Tyr Pro Gly Gly Ala Gly Thr Pro Glu Asp Leu Trp Arg Leu Val
 1090 1095 1100
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 Asp Leu Ala Arg Leu Phe His Pro Asp Pro Asp Arg Ser Gly Thr Ser
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 Cys Thr Arg Gln Gly Gly Phe Leu Tyr Asp Ala Ala Asp Phe Asp Ala
 1140 1145 1150
 Glu Phe Phe Asp Ile Ser Pro Arg Glu Ala Leu Ala Val Asp Pro Gln
 1155 1160 1165
 Gln Arg Leu Leu Leu Glu Cys Ala Trp Glu Ala Phe Glu Arg Ala Gly
 1170 1175 1180
 Leu Asp Pro Arg Ala Leu Lys Gly Ser Pro Thr Gly Val Phe Val Gly
 1185 1190 1195 1200
 Met Thr Gly Gln Asp Tyr Gly Pro Arg Leu His Glu Pro Ser Gln Ala
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 Thr Asp Gly Tyr Leu Leu Thr Gly Ser Thr Pro Ser Val Ala Ser Gly
 1220 1225 1230
 Arg Leu Ser Phe Ser Phe Gly Leu Glu Gly Pro Ala Leu Thr Val Asp
 1235 1240 1245
 Thr Ala Cys Ser Ser Ser Leu Val Thr Leu His Leu Ala Ala Gln Ala
 1250 1255 1260
 Leu Arg Arg Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Ala Thr Val
 1265 1270 1275 1280
 Leu Ala Thr Pro Gly Met Phe Thr Glu Phe Ser Arg Gln Arg Gly Leu
 1285 1290 1295
 Ala Pro Asp Gly Arg Cys Lys Pro Phe Ala Ala Gly Ala Asp Gly Thr
 1300 1305 1310
 Gly Trp Ala Glu Gly Val Gly Leu Val Leu Leu Glu Arg Leu Ser Glu
 1315 1320 1325

Ala Arg Arg Lys Gly His Ala Val Leu Ala Val Ile Arg Gly Ser Ala
 1330 1335 1340
 Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro
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 Ser Gln Gln Arg Val Ile Arg Ala Ala Leu Ala Ala Ala Arg Leu Thr
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 Ala Asp Glu Val Asp Val Val Glu Ala His Gly Thr Gly Thr Thr Leu
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 Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Gly
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 Arg Ser Ala Glu Arg Pro Leu Trp Leu Gly Ser Val Lys Ser Asn Ile
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 Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val
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 Met Ala Met Arg His Asp Leu Leu Pro Ala Thr Leu His Val Asp Glu
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 Pro Ser Gly His Val Asp Trp Ser Thr Gly Ala Val Arg Leu Leu Thr
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 Glu Pro Val Val Trp Pro Arg Gly Glu Arg Pro Arg Arg Ala Ala Val
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 Ala Leu Arg Glu Gln Ala Arg Arg Leu Arg Glu Leu Val Thr Gly Gly
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 Ser Ala Asp Val Ser Val Ser Gly Val Gly Arg Ser Leu Val Thr Thr
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 Arg Ala Val Phe Glu His Arg Ala Val Val Val Gly Arg Asp Arg Asp
 1570 1575 1580
 Thr Leu Ile Gly Gly Leu Glu Ala Leu Ala Ala Gly Asp Ala Ser Pro
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 Asp Val Val Cys Gly Val Ala Gly Asp Val Gly Pro Gly Pro Val Leu
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 Val Phe Pro Gly Gln Gly Ser Gln Trp Val Gly Met Gly Ala Gln Leu
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 Leu Gly Glu Ser Ala Val Phe Ala Ala Arg Ile Asp Ala Cys Glu Gln
 1635 1640 1645
 Ala Leu Ser Pro Tyr Val Asp Trp Ser Leu Thr Glu Val Leu Arg Gly
 1650 1655 1660
 Asp Gly Arg Glu Leu Ser Arg Val Asp Val Val Gln Pro Val Leu Trp
 1665 1670 1675 1680

Ala Val Met Val Ser Leu Ala Ala Val Trp Ala Asp His Gly Val Thr
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 Pro Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Val Val
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 Arg Ser Arg Ala Leu Arg Gln Leu Ser Gly Gly Gly Ala Met Ala Ser
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 Leu Gly Val Gly Gln Glu Gln Ala Ala Glu Leu Val Glu Gly His Pro
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 Gly Val Gly Ile Ala Ala Val Asn Gly Pro Ser Ser Thr Val Ile Ser
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 1780 1785 1790
 Glu Leu Arg Gly Arg Val Ile Asp Val Asp Tyr Ala Ser His Ser Pro
 1795 1800 1805
 Gln Val Asp Ala Ile Thr Asp Glu Leu Thr His Thr Leu Ser Gly Val
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 Arg Pro Thr Thr Ala Pro Val Ala Phe Tyr Ser Ala Val Thr Gly Thr
 1825 1830 1835 1840
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 1845 1850 1855
 Arg Arg Pro Val Arg Phe Ala Asp Ala Val Thr Ala Leu Leu Ala Asp
 1860 1865 1870
 Gly His Arg Val Phe Ile Glu Ala Ser Ser His Pro Val Leu Thr Leu
 1875 1880 1885
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 1890 1895 1900
 Pro Thr Leu Arg Arg Glu Asp Gly Gly Arg Ala Arg Leu Ala Arg Ser
 1905 1910 1915 1920
 Leu Ala Gln Ala Phe Gly Ala Gly Cys Ala Val Arg Trp Glu Asn Trp
 1925 1930 1935
 Phe Pro Ala Thr Gly Thr Ser Thr Val Glu Leu Pro Thr Tyr Ala Phe
 1940 1945 1950
 Gln Arg Arg Arg Tyr Trp Leu Glu Ala Pro Thr Gly Thr Gln Asp Ala
 1955 1960 1965
 Ala Gly Leu Gly Leu Ala Ala Ala Gly His Pro Leu Leu Gly Ala Ala
 1970 1975 1980
 Thr Glu Ile Ala Asp Gly Asp Ile Arg Leu Leu Thr Gly Arg Ile Ser
 1985 1990 1995 2000
 Arg His Ser His Pro Trp Leu Ala Gln His Thr Leu Phe Gly Ala Ala
 2005 2010 2015
 Val Val Pro Ala Ser Val Leu Ala Glu Trp Ala Leu Arg Ala Ala Asp
 2020 2025 2030

Glu Ala Gly Cys Pro Arg Val Asp Asp Leu Thr Leu Arg Thr Pro Leu
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 Val Leu Pro Glu Thr Ala Gly Val Gln Val Gln Ile Val Val Gly Pro
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 Ala Asp Ala Arg Asp Gly His Arg Asp Phe His Val Tyr Ala Arg Pro
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 Asp Gly Lys Asp Ala Ser Glu Gly Glu Gly Ile Ala Glu Gly Glu Gly
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 2100 2105 2110
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 Asp Leu Gly Asp Phe Tyr Glu Arg Ala Ala Ala Thr Gly Val Gly Tyr
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 Gly Pro Val Phe Thr Gly Leu Arg Ala Leu Trp Arg Arg Asp Gly Glu
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 Leu Phe Ala Glu Ala Val Leu Pro Gln Glu Ala Pro Glu Thr Ala Gly
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 Phe Gly Met His Pro Ala Leu Leu Asp Ala Ala Leu His Pro Ala Leu
 2195 2200 2205
 Leu Gly Glu Arg Pro Ala Glu Glu Asp Lys Val Trp Leu Pro Phe Thr
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 2225 2230 2235 2240
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 2245 2250 2255
 Ala Trp Arg Val Gly Val Ser Asp Pro Thr Gly Ala Glu Val Leu Thr
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 Cys Glu Ala Leu Val Ala Val Ala Ala Gly Arg Arg Glu Leu Arg Ala
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 Ala Gly Glu Arg Val Ser Asp Leu Tyr Ala Val Glu Trp Val Pro Val
 2290 2295 2300
 Pro Gly Pro Gly Pro Val Gly Glu Gly Ala Asp Phe Ser Gly Trp Ala
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 2325 2330 2335
 Arg Trp Tyr Glu Asp Leu Asp Ala Leu Gly Ala Ala Val Glu Gly Gly
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Gly Ala Leu Leu Asp Gln Trp Leu Ala Asp Ala Arg Phe Ala Asp Ala
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 Leu Pro Asp Pro Ala Ala Ala Ala Val Arg Gly Leu Val Glu Gln Ala
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 Gln Val Arg His Pro Gly Arg Ile Leu Leu Val Asp Thr Glu Ala Gly
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 Ala Gly Arg Val Leu Ala Pro Arg Leu Thr Ala Pro Gln Asp Ala Ala
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 Val Thr Glu Ala Ala Arg Pro Leu Asp Pro Asp Gly Thr Val Leu Ile
 2500 2505 2510
 Thr Gly Pro Ala Gly Ala Pro Val Ala Asp Leu Ala Glu His Leu Val
 2515 2520 2525
 Arg Thr Gly Gln Cys Arg His Leu Leu Leu Leu Pro Gly Asp Gly Glu
 2530 2535 2540
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 2545 2550 2555 2560
 Leu Ser Thr Ala Asp Pro Ala Asp Pro Thr Ala Leu Ala Glu Val Val
 2565 2570 2575
 Ala Ala Val Glu Gly Asp His Pro Leu Thr Gly Val Ile His Ala Thr
 2580 2585 2590
 Gly Val Val Asp Ala Phe Asp Pro Gly Asp Ser Ala Ser Asp Leu Met
 2595 2600 2605
 Ile Asp Ser Ala Ser Asp Ser Phe Ala Glu Ala Trp Ser Ser Arg Ala
 2610 2615 2620
 Gly Val Thr Ala Ala Leu His Thr Ala Thr Ala His Leu Pro Leu Asp
 2625 2630 2635 2640
 Leu Phe Ala Val Leu Ser Pro Ala Gly Ala Asp Leu Gly Ile Ala Arg
 2645 2650 2655
 Ser Ala Ala Ala Ala Gly Ala Asp Ala Phe Ser Ala Ala Leu Ala Leu
 2660 2665 2670
 Arg Arg His Thr Thr Val Thr Thr Asp Thr Thr Ala Pro Pro Arg Thr
 2675 2680 2685
 Thr Ala Pro Pro Arg Thr Thr Ala Ser Pro Arg Thr Thr Ala Leu Ser
 2690 2695 2700
 Ser Ser Arg Thr Thr Gly Val Ala Leu Ala Tyr Gly Pro Pro Thr Ala
 2705 2710 2715 2720
 Pro Arg Pro Gly Ile Lys Gly Thr Ala Pro Gly Arg Ile Pro Val Leu
 2725 2730 2735

Leu Asp Ala Ala Arg Ala His Gly Gly Gly Ser Pro Leu Leu Gly Ala
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 Arg Leu Ala Ala Arg Ala Leu Ala Ala Glu Ser Ala Ala Glu Gly Val
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 Leu Leu Ile Asp Ala Val Arg Thr His Ala Ala Ala Val Leu Gly Arg
 2820 2825 2830
 Thr Asp Pro Glu Ala Leu Arg Gly Asp Ala Thr Phe Lys Gln Leu Gly
 2835 2840 2845
 Leu Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Val Glu Asp
 2850 2855 2860
 Thr Gly Leu Arg Leu Pro Thr Ala Leu Val Phe Arg Tyr Pro Thr Pro
 2865 2870 2875 2880
 Ala Ala Ile Ala Ala His Leu Arg Glu Arg Leu Thr Ser Pro Ser Glu
 2885 2890 2895
 Thr Thr Ala Thr Gln Arg Ser Gly Gly Gln Thr Pro Ala Ala Gly Gln
 2900 2905 2910
 Ala Ser Ser Ala Leu Ala Pro Gly Gly Ser Ala Ala Gly Pro Pro Ala
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 Ala Asp Thr Val Leu Ser Asp Leu Thr Arg Met Glu Asn Thr Leu Ser
 2930 2935 2940
 Val Leu Ala Ala Gln Leu Pro His Thr Glu Thr Gly Glu Ile Thr Thr
 2945 2950 2955 2960
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 2965 2970 2975
 Asn Asp Ser Gly Asp Gly Asn Gly Gly Asp Asp Asp Ala Ala Glu Arg
 2980 2985 2990
 Leu Lys Ala Ala Ser Ala Asp Gln Ile Phe Asp Phe Ile Asp Asn Glu
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 Leu Gly Val Gly His Gly Thr Ser Arg Val Thr Pro Thr Pro Lys Ala
 3010 3015 3020

Gly
 3025

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 <211> 2238
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 20

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Glu	Leu	His	Asp	Thr	Arg	Arg	Arg	Leu	Val	Gln	Glu	Glu	Asp	Arg	Arg
			20					25					30		
Gln	Glu	Pro	Val	Ala	Leu	Val	Gly	Met	Ala	Cys	Arg	Phe	Pro	Gly	Gly
		35					40					45			
Val	Ala	Ser	Pro	Glu	Asp	Leu	Trp	Asp	Leu	Val	Ala	Ala	Gly	Lys	Asp
	50					55					60				
Ala	Ile	Glu	Asp	Phe	Pro	Thr	Asp	Arg	Gly	Trp	Asp	Leu	Glu	Ala	Leu
65					70					75					80
Tyr	Asp	Pro	Asp	Pro	Ala	Ala	Tyr	Gly	Thr	Ser	Tyr	Val	Arg	His	Gly
				85					90					95	
Gly	Phe	Val	Asp	Asp	Ala	Gly	Ser	Phe	Asp	Ala	Asp	Phe	Phe	Gly	Ile
			100					105					110		
Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Met	Leu
		115					120					125			
Glu	Thr	Ser	Trp	Glu	Leu	Phe	Glu	Arg	Ala	Gly	Ile	Glu	Pro	Val	Ser
	130					135					140				
Leu	Lys	Gly	Ser	Arg	Thr	Gly	Val	Tyr	Ala	Gly	Val	Ser	Ser	Glu	Asp
145					150					155					160
Tyr	Met	Ser	Gln	Leu	Pro	Arg	Ile	Pro	Glu	Gly	Phe	Glu	Gly	His	Ala
				165					170					175	
Thr	Thr	Gly	Ser	Leu	Thr	Ser	Val	Ile	Ser	Gly	Arg	Val	Ala	Tyr	Asn
			180					185					190		
Tyr	Gly	Leu	Glu	Gly	Pro	Ala	Val	Thr	Val	Asp	Thr	Ala	Cys	Ser	Ala
		195					200					205			
Ser	Leu	Val	Ala	Ile	His	Leu	Ala	Ser	Gln	Ala	Leu	Arg	Gln	Arg	Glu
	210					215					220				
Cys	Asp	Leu	Ala	Leu	Ala	Gly	Gly	Val	Leu	Val	Leu	Ser	Ser	Pro	Leu
225					230					235					240
Met	Phe	Thr	Glu	Phe	Cys	Arg	Gln	Arg	Gly	Leu	Ala	Pro	Asp	Gly	Arg
				245					250					255	
Cys	Lys	Pro	Phe	Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Phe	Ser	Glu	Gly
			260					265					270		
Ile	Gly	Leu	Leu	Leu	Leu	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly
		275					280					285			
His	Lys	Val	Leu	Ala	Val	Ile	Arg	Gly	Ser	Ala	Val	Asn	Gln	Asp	Gly
	290					295					300				
Ala	Ser	Asn	Gly	Leu	Thr	Ala	Pro	Asn	Asp	Ala	Ala	Gln	Glu	Gln	Val
305					310					315					320
Ile	Arg	Ala	Ala	Leu	Asp	Asn	Ala	Arg	Leu	Thr	Pro	Ser	Glu	Val	Asp
				325					330					335	

Ala Val Glu Ala His Gly Thr Gly Thr Lys Leu Gly Asp Pro Ile Glu
 340 345 350
 Ala Gly Ala Leu Leu Ala Thr Tyr Gly Gln His Arg Ala Arg Pro Leu
 355 360 365
 Leu Leu Gly Ser Leu Lys Ser Asn Ile Gly His Thr His Ala Thr Ala
 370 375 380
 Gly Val Ala Gly Val Ile Lys Thr Val Met Ala Ile Arg Asn Gly Leu
 385 390 395 400
 Leu Pro Ala Thr Leu His Val Glu Glu Leu Ser Pro His Val Asp Trp
 405 410 415
 Asp Ala Gly Ala Val Glu Val Val Thr Glu Pro Thr Pro Trp Pro Glu
 420 425 430
 Thr Gly His Pro Arg Arg Ala Gly Val Ser Ala Phe Gly Ile Ser Gly
 435 440 445
 Thr Asn Ala His Leu Ile Leu Glu Glu Ala Pro Pro Glu Glu Asp Val
 450 455 460
 Pro Ala Pro Val Val Val Glu Ser Gly Gly Val Val Pro Trp Val Val
 465 470 475 480
 Ser Gly Arg Thr Pro Glu Ala Leu Arg Glu Gln Ala Arg Arg Leu Gly
 485 490 495
 Glu Phe Val Ala Gly Asp Thr Asp Ala Leu Pro Asn Glu Val Gly Trp
 500 505 510
 Ser Leu Ala Thr Thr Arg Ser Val Phe Glu His Arg Ala Val Val Val
 515 520 525
 Gly Arg Asp Arg Asp Ala Leu Thr Ala Gly Leu Gly Ala Leu Ala Ala
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 Gly Glu Ala Ser Ala Gly Val Val Ala Gly Val Ala Gly Asp Val Gly
 545 550 555 560
 Pro Gly Pro Val Leu Val Phe Pro Gly Gln Gly Ala Gln Trp Val Gly
 565 570 575
 Met Gly Ala Gln Leu Leu Asp Glu Ser Ala Val Phe Ala Ala Arg Ile
 580 585 590
 Ala Glu Cys Glu Arg Ala Leu Ser Ala His Val Asp Trp Ser Leu Ser
 595 600 605
 Ala Val Leu Arg Gly Asp Gly Ser Glu Leu Ser Arg Val Glu Val Val
 610 615 620
 Gln Pro Val Leu Trp Ala Val Met Val Ser Leu Ala Ala Val Trp Ala
 625 630 635 640
 Asp Tyr Gly Val Thr Pro Ala Ala Val Ile Gly His Ser Gln Gly Glu
 645 650 655
 Met Ala Ala Ala Cys Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala
 660 665 670
 Arg Ile Val Ala Val Arg Ser Asp Ala Leu Arg Gln Leu Gln Gly His
 675 680 685

Gly	Asp	Met	Ala	Ser	Leu	Ser	Thr	Gly	Ala	Glu	Gln	Ala	Ala	Glu	Leu	690	695	700
Ile	Gly	Asp	Arg	Pro	Gly	Val	Val	Val	Ala	Ala	Val	Asn	Gly	Pro	Ser	705	710	715
Ser	Thr	Val	Ile	Ser	Gly	Pro	Pro	Glu	His	Val	Ala	Ala	Val	Val	Ala	725	730	735
Asp	Ala	Glu	Ala	Arg	Gly	Leu	Arg	Ala	Arg	Val	Ile	Asp	Val	Gly	Tyr	740	745	750
Ala	Ser	His	Gly	Pro	Gln	Ile	Asp	Gln	Leu	His	Asp	Leu	Leu	Thr	Glu	755	760	765
Arg	Leu	Ala	Asp	Ile	Arg	Pro	Thr	Asn	Thr	Asp	Val	Ala	Phe	Tyr	Ser	770	775	780
Thr	Val	Thr	Ala	Glu	Arg	Leu	Thr	Asp	Thr	Thr	Ala	Leu	Asp	Thr	Asp	785	790	795
Tyr	Trp	Val	Thr	Asn	Leu	Arg	Gln	Pro	Val	Arg	Phe	Ala	Asp	Thr	Ile	805	810	815
Glu	Ala	Leu	Leu	Ala	Asp	Gly	Tyr	Arg	Leu	Phe	Ile	Glu	Ala	Ser	Ala	820	825	830
His	Pro	Val	Leu	Gly	Leu	Gly	Met	Glu	Glu	Thr	Ile	Glu	Gln	Ala	Asp	835	840	845
Met	Pro	Ala	Thr	Val	Val	Pro	Thr	Leu	Arg	Arg	Asp	His	Gly	Asp	Thr	850	855	860
Thr	Gln	Leu	Thr	Arg	Ala	Ala	Ala	His	Ala	Phe	Thr	Ala	Gly	Ala	Asp	865	870	875
Val	Asp	Trp	Arg	Arg	Trp	Phe	Pro	Ala	Asp	Pro	Ala	Pro	Arg	Thr	Ile	885	890	895
Asp	Leu	Pro	Thr	Tyr	Ala	Phe	Gln	Arg	Arg	Arg	Tyr	Trp	Leu	Ala	Asp	900	905	910
Thr	Val	Lys	Arg	Asp	Ser	Gly	Trp	Asp	Pro	Ala	Gly	Ser	Gly	His	Ala	915	920	925
Gln	Leu	Pro	Thr	Ala	Val	Ala	Leu	Ala	Asp	Gly	Gly	Val	Val	Leu	Asn	930	935	940
Gly	Arg	Val	Ser	Ala	Glu	Arg	Gly	Gly	Trp	Leu	Gly	Gly	His	Val	Val	945	950	955
Ala	Gly	Thr	Val	Leu	Val	Pro	Gly	Ala	Ala	Leu	Val	Glu	Trp	Val	Leu	965	970	975
Arg	Ala	Gly	Asp	Glu	Ala	Gly	Cys	Pro	Ser	Leu	Glu	Glu	Leu	Thr	Leu	980	985	990
Gln	Ala	Pro	Leu	Val	Leu	Pro	Glu	Ser	Gly	Gly	Leu	Gln	Val	Gln	Val	995	1000	1005
Val	Val	Gly	Ala	Ala	Asp	Glu	Gln	Gly	Gly	Arg	Arg	Asp	Val	His	Val	1010	1015	1020
Tyr	Ser	Arg	Ser	Glu	Gln	Asp	Ala	Ser	Ala	Val	Trp	Gln	Cys	His	Ala	1025	1030	1035

Val Gly Glu Leu Gly Arg Ala Ser Val Ala Arg Pro Val Arg Gln Ala
1045 1050 1055
Gly Gln Trp Pro Pro Ala Gly Ala Glu Pro Val Glu Val Gly Gly Phe
1060 1065 1070
Tyr Glu Gly Val Ala Ala Ala Gly Tyr Glu Tyr Gly Pro Ala Phe Arg
1075 1080 1085
Gly Leu Arg Ala Met Trp Arg His Gly Asp Asp Leu Leu Ala Glu Val
1090 1095 1100
Glu Leu Pro Glu Glu Ala Gly Ser Pro Ala Gly Phe Gly Ile His Pro
1105 1110 1115 1120
Ala Leu Leu Asp Ala Ala Leu His Pro Leu Leu Ala Gln Arg Ser Arg
1125 1130 1135
Asp Gly Ala Gly Ala Gly Ala His Gly Gly Gln Val Leu Leu Pro Phe
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Val Arg Leu Thr Gly Leu Gly Gly Gly Asp Asp Glu Thr Val Ser Leu
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Thr Val Thr Asp Pro Ala Gly Gly Pro Val Val Asp Val Ala Glu Leu
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Arg Leu Arg Ser Thr Ser Ala Arg Gln Val Arg Gly Ser Ala Gly Pro
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Ser Gly Cys Ala Val Leu Gly Glu Leu Val Ala Glu Pro Gly Pro Gly
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Ile Asp Leu Glu Gly Cys Pro Cys Tyr Pro Gly Val Gly Ala Leu Ala
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Asp Asn Ala Ser Pro Pro Ser Met Ile Leu Ala Pro Val His Ser Asp
1285 1290 1295
Thr Thr Gly Gly Asp Gly Leu Ala Leu Thr Glu Arg Val Leu Arg Val
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Ile Gln Asp Phe Leu Ala Ala Pro Ser Leu Glu Gln Lys Gln Thr Arg
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Trp Gly Leu Val Arg Ser Ala Gln Ser Glu Asn Pro Gly Arg Phe Val
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Leu Leu Asp Thr Asp Ala Pro Leu Asp Gln Ala Ser Val Ala Pro Leu
1380 1385 1390

Val Asp Ala Val Arg Ser Ala Val Glu Ala Asp Glu Pro Gln Val Ala
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Asp Ile Val Leu Arg Pro Leu Ala Pro Gly Gln Val Arg Val Ala Val
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His Thr Ala Gly Val Asn Phe Arg Asp Val Leu Ile Ala Leu Gly Met
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Tyr Pro Asp Pro Asp Ala Leu Pro Gly Thr Glu Ala Ala Gly Val Val
1490 1495 1500
Thr Glu Val Gly Pro Gly Val Thr Arg Leu Ser Val Gly Asp Arg Val
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Met Gly Met Met Asp Gly Ala Phe Gly Pro Trp Ala Val Ala Asp Ala
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Arg Met Leu Ala Pro Val Pro Pro Gly Trp Gly Thr Arg Gln Ala Ala
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Ala Ala Pro Ala Ala Phe Leu Thr Ala Trp Tyr Gly Leu Val Glu Leu
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Ala Gly Leu Lys Ala Gly Glu Arg Val Leu Ile His Ala Ala Thr Gly
1570 1575 1580
Gly Val Gly Met Ala Ala Val Gln Ile Ala Arg His Val Gly Ala Glu
1585 1590 1595 1600
Val Phe Ala Thr Ala Ser Pro Gly Lys His Ala Val Leu Glu Glu Met
1605 1610 1615
Gly Ile Asp Ala Ala His Arg Ala Ser Ser Arg Asp Leu Ala Phe Glu
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Asp Ala Phe Arg Gln Ala Thr Asp Gly Arg Gly Val Asp Val Val Leu
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Asn Ser Leu Thr Gly Glu Leu Leu Asp Ala Ser Leu Arg Leu Leu Gly
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Asp Gly Gly Arg Phe Val Glu Met Gly Lys Ser Asp Pro Arg Asp Pro
1665 1670 1675 1680
Glu Leu Val Ala Leu Glu His Pro Gly Val Ser Tyr Glu Ala Phe Asp
1685 1690 1695
Leu Val Ala Asp Ala Gly Pro Glu Arg Leu Gly Leu Met Leu Asp Arg
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Leu Gly Glu Leu Phe Ala Gly Gly Ser Leu Val Pro Leu Pro Val Thr
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1730 1735 1740

Ala Arg His Thr Gly Lys Leu Val Leu Asp Val Pro Ala Pro Leu Asp
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 Pro Asp Gly Thr Val Leu Val Thr Gly Gly Thr Gly Thr Ile Gly Ala
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 Ala Val Ala Glu His Leu Ala Arg Thr Gly Glu Ser Lys His Leu Leu
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 Ile Val Ser Arg Ser Gly Pro Ala Ala His Gly Ala Glu Glu Leu Val
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 Ser Arg Ile Ala Glu Phe Gly Ala Glu Ala Thr Phe Val Ala Ala Asp
 1810 1815 1820
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 1825 1830 1835 1840
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 1845 1850 1855
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 Ala Lys Ala Ala Ala Ala Gln Gln Leu His Glu Ala Thr Arg Glu Ser
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 Arg Leu Gly Leu Phe Val Met Phe Ser Ser Phe Ala Ser Thr Met Gly
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 Thr Pro Gly Gln Ala Asn Tyr Ser Ala Ala Asn Ala Tyr Cys Asp Ala
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 Trp Gly Leu Trp Glu Ala Thr Ser Gly Leu Thr Gly Thr Leu Ser Ala
 1940 1945 1950
 Ala Asp Arg Ala Arg Ile Asp Arg Tyr Gly Ile Arg Pro Thr Ser Ala
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 Ala Arg Gly Cys Ala Leu Leu Ala Ala Ala Arg Ala His Gly Arg Pro
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 Asp Leu Leu Ala Met Asp Leu Asp Ala Arg Val Pro Ala Ala Ser Asp
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 35 40 45
 Ile Arg Thr Pro Glu Asp Leu Trp Asp Leu Val Ala Ala Gly Gly Asn
 50 55 60
 Ala Leu Gly Ala Phe Pro Asp Asn Arg Gly Trp Asp Leu Arg Arg Leu
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 Phe His Pro Asp Pro Asp His Pro Gly Thr Thr Tyr Ala Arg Glu Gly
 85 90 95
 Gly Phe Leu His Asp Ala Asp Leu Phe Asp Pro Glu Phe Phe Gly Ile
 100 105 110
 Ser Pro Arg Glu Ala Ala Val Leu Asp Pro Gln Gln Arg Leu Leu Leu
 115 120 125
 Glu Cys Ala Trp Glu Ala Leu Glu Arg Ala Gly Ile Asp Pro Arg Ser
 130 135 140
 Leu Gln Gly Ser Arg Thr Gly Val Tyr Ala Gly Ala Ala Leu Pro Gly
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Phe Gly Thr Pro His Ile Asp Pro Ala Ala Glu Gly His Leu Val Thr
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Gly Ser Ala Pro Ser Val Leu Ser Gly Arg Leu Ala Tyr Thr Phe Gly
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Leu Glu Gly Pro Ala Val Thr Ile Asp Thr Ala Cys Ser Ser Ser Leu
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Val Ala Val His Leu Ala Ala His Ala Leu Arg Gln Arg Glu Cys Asp
210 215 220
Leu Ala Leu Ala Gly Gly Val Thr Val Met Thr Thr Pro Tyr Val Phe
225 230 235 240
Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys
245 250 255
Pro Phe Ala Ala Ala Asp Gly Thr Ala Phe Ser Glu Gly Ala Gly
260 265 270
Leu Leu Val Leu Glu Arg Leu Ser Asp Ala Arg Arg Ala Gly His Arg
275 280 285
Val Leu Ala Val Ile Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser
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Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala Gln Gln Arg Val Ile Arg
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325 330 335
Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Asp
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Ala Leu Leu Ala Thr Tyr Gly Gln Glu Arg His Gly Gly Arg Pro Leu
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Trp Leu Gly Ser Val Lys Ser Asn Ile Gly His Thr Gln Gly Ala Ala
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Leu Pro Ala Thr Leu Tyr Ala Asp Glu Pro Thr Pro His Ala Asp Trp
405 410 415
Glu Ser Gly Ala Val Arg Leu Leu Ser Ala Pro Val Ala Trp Pro Arg
420 425 430
Gly Glu His Gly Glu His Thr Arg Ala Gly Ile Ser Ser Phe Gly
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Ile Ser Gly Thr Asn Ala His Leu Ile Leu Glu Glu Ala Pro Ala Ala
450 455 460
Asp Ala Glu Gly Ala Gly Asp Gly Asp Gly Asp Gly Gly Gly Val
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Arg Pro Val Val Arg Val Gly Ala Thr Gly Pro Arg Glu Glu Gln Gly
485 490 495
Gln Gly Gln Gly Gln Glu Gln His Gln Gln Gln Arg Gln Gln Arg Gln
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Arg Ser Ser Met Met Pro Thr Pro His Leu Pro Trp Leu Leu Ser Ala
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 Arg Ser Pro Ala Ala Leu Arg Ala Gln Ala Asp Ala Leu Ala Asn His
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 Arg Arg Thr Leu Phe Glu His Arg Ala Val Val Leu Gly Thr Asp Arg
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 Thr Ser Phe Gly Ile Ala Pro Ser His Leu Thr Gly His Ser Val Gly
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 Cys Thr Leu Val Ala Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Ala
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 740 745 750
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 770 775 780
 Glu Lys Ala Leu Arg Gly Arg Gly Leu Lys Thr Lys Arg Leu Asn Val
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 Ser His Ala Phe His Ser Pro Leu Ile Glu Pro Met Leu Asp Asp Phe
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 Ala Glu Tyr Trp Val Arg His Val Arg Arg Pro Val Arg Phe His Asp
 850 855 860

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 885 890 895
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 His Thr Asp Gly Gln Pro Ala Asp Leu Thr Ala Leu Phe Pro Ala Asp
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 Ala Gly Gln Val Pro Leu Pro Thr Tyr Arg Phe Gln Arg Arg Arg Tyr
 945 950 955 960
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 1395 1400 1405
 Thr Glu Thr Asp Val Pro Ala Gln Val Arg Ala His Ala Arg His Ala
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 Asp Ile Asp Lys Asp Thr Asp Glu Glu Thr Asp Gln Ala Thr Asp Ala
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 Pro Arg Leu Ala Val Val Pro Pro Arg Thr Asp Thr Pro Ala Leu His
 1540 1545 1550
 Ala Thr Ala Pro Glu Ser Thr Thr Asp Thr Val Asp Ser Thr Gly Ile
 1555 1560 1565

Ala Gly Ala Ala Glu Ser Gly Gly Thr Val Leu Ile Thr Gly Gly Thr
 1570 1575 1580
 Gly Gly Leu Gly Gln Ala Val Ala Arg His Leu Ala Ala Ala His Gly
 1585 1590 1595 1600
 Ala Arg His Leu Leu Leu Val Ser Arg Arg Gly Asp Ala Ala Glu Gly
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 1620 1625 1630
 Val Ala Ala Cys Asp Ile Thr Asp Arg Asp Ala Leu Ala Gly Leu Leu
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 1650 1655 1660
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 1780 1785 1790
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 1825 1830 1835 1840
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 1845 1850 1855
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 1860 1865 1870
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 1875 1880 1885
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 1890 1895 1900
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 1905 1910 1915 1920

Gly Ile Arg Leu Pro Ala Thr Leu Val Phe Asp His Pro Ser Pro Thr
 1925 1930 1935
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 1940 1945 1950
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 1955 1960 1965
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 His Ser Asp His Asp Ala Val Arg Pro Asp Thr Ser Phe Lys Glu Leu
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 Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Ala Ala
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 Ala Thr Gly Leu Lys Leu Pro Ala Ala Leu Val Phe Asp Tyr Pro Glu
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Ser Ala Thr Leu Val Asp His Leu Leu Glu Arg Leu Ser Pro Asp Gly
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 Ala Pro Pro Pro Val Lys Asp Ala Ala Asp Pro Val Leu Asn Asp Leu
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 Gly Arg Ile Glu Ser Ser Leu Asp Ala Leu Ala Leu Asp Ala Asp Ala
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 Arg Ser Arg Val Thr Arg Arg Leu Asn Thr Leu Leu Ser Lys Leu Asn
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 Asp Arg Glu Leu
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 <212> PRT
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 Ser Gly Thr Gly Glu Ser Ala Thr Gly Thr Ser Ser Thr Glu Ala Lys
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 Leu Arg Gln Tyr Leu Lys Arg Val Thr Val Asp Leu Gly Gln Ala Arg
 35 40 45
 Arg Arg Leu Arg Glu Val Glu Glu Arg Ala Gln Glu Pro Ile Ala Ile
 50 55 60
 Val Ser Met Ala Cys Arg Phe Pro Gly Asp Thr Arg Thr Pro Glu Ala
 65 70 75 80
 Leu Trp Asp Leu Val Ala Glu Gly Gly Asp Ala Ile Asp Asp Phe Pro
 85 90 95
 Thr Asn Arg Gly Trp Asp Leu Glu Ser Leu Tyr His Pro Asp Pro Asp
 100 105 110
 His Pro Gly Thr Ser Tyr Val Arg Arg Gly Gly Phe Leu Tyr Asp Ala
 115 120 125
 Pro Ala Phe Asp Ala Ser Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu
 130 135 140
 Ala Met Asp Pro Gln Gln Arg Val Leu Met Glu Thr Ala Trp Gln Leu
 145 150 155 160
 Leu Glu Arg Ala Gly Ile Asp Pro Ala Ser Leu Lys Leu Ser Ala Thr
 165 170 175
 Gly Val Tyr Ile Gly Ala Gly Val Leu Gly Phe Gly Gly Ala Gln Pro
 180 185 190

Asp	Lys	Thr	Val	Glu	Gly	His	Leu	Leu	Thr	Gly	Ser	Ala	Leu	Ser	Val
		195					200					205			
Leu	Ser	Gly	Arg	Ile	Ser	Phe	Thr	Leu	Gly	Leu	Glu	Gly	Pro	Ser	Val
	210					215					220				
Ser	Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ser	Met	His	Leu	Ala
225					230					235					240
Ala	Gln	Ala	Leu	Arg	Gln	Gly	Glu	Cys	Asp	Leu	Ala	Leu	Ala	Gly	Gly
				245					250					255	
Val	Thr	Val	Met	Ser	Thr	Pro	Gly	Ala	Phe	Thr	Glu	Phe	Ser	Arg	Gln
			260					265					270		
Gly	Ala	Leu	Ser	Pro	Asp	Gly	Arg	Ser	Lys	Ala	Phe	Ala	Ala	Ser	Ala
	275						280					285			
Asp	Gly	Thr	Gly	Phe	Ser	Glu	Gly	Ala	Gly	Leu	Leu	Leu	Leu	Glu	Arg
	290					295					300				
Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly	His	Lys	Val	Leu	Ala	Val	Ile	Arg
305					310					315					320
Gly	Ser	Ala	Val	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala	Pro
				325					330					335	
Asn	Gly	Pro	Ser	Gln	Glu	Arg	Val	Ile	Arg	Ala	Ala	Leu	Ala	Asn	Ala
			340					345					350		
Gly	Leu	Gly	Ala	Ala	Glu	Val	Asp	Ala	Val	Glu	Ala	His	Gly	Thr	Gly
	355						360					365			
Thr	Lys	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gly	Ala	Leu	Leu	Ala	Thr	Tyr
	370					375					380				
Gly	Arg	Asp	Arg	Asp	Glu	Asp	Arg	Pro	Leu	Trp	Leu	Gly	Ser	Val	Lys
385					390					395					400
Ser	Asn	Ile	Gly	His	Pro	Gln	Gly	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile
				405					410					415	
Lys	Met	Val	Met	Ala	Leu	Gln	Arg	Glu	Leu	Leu	Pro	Ala	Thr	Leu	Tyr
			420					425					430		
Val	Asp	Glu	Pro	Thr	Pro	His	Val	Asp	Trp	Ser	Ser	Gly	Ser	Val	Arg
	435						440					445			
Leu	Leu	Thr	Glu	Pro	Val	Pro	Trp	Thr	Arg	Gly	Glu	Arg	Pro	Arg	Arg
	450					455					460				
Ala	Gly	Val	Ser	Ala	Phe	Gly	Met	Ser	Gly	Thr	Asn	Ala	His	Val	Ile
465					470					475					480
Leu	Glu	Glu	Ala	Pro	Pro	Glu	Glu	Ala	Ala	Ala	Ala	Glu	Thr	Pro	Ala
				485					490					495	
Glu	Gly	Thr	Gly	Ala	Val	Val	Pro	Trp	Val	Val	Ser	Gly	Arg	Gly	Glu
			500					505					510		
Glu	Ala	Leu	Arg	Ala	Gln	Ala	Ala	Gln	Leu	Ala	Glu	His	Val	Arg	Asp
	515						520					525			
Asp	Asp	Gln	Arg	Pro	Ala	Ser	Pro	Leu	Glu	Val	Gly	Trp	Ser	Leu	Ala
	530					535					540				

Thr	Thr	Arg	Ser	Val	Phe	Glu	Asn	Arg	Ala	Val	Val	Val	Gly	Asp	Asp	545	550	555	560
Arg	Asp	Ala	Leu	Leu	Asp	Gly	Leu	Arg	Ser	Leu	Ala	Ala	Gly	Glu	Ala	565	570	575	
Ser	Pro	Asp	Val	Val	Ser	Gly	Ala	Val	Gly	Pro	Thr	Gly	Pro	Gly	Pro	580	585	590	
Val	Met	Val	Phe	Pro	Gly	Gln	Gly	Gly	Gln	Trp	Val	Gly	Met	Gly	Ala	595	600	605	
Arg	Leu	Leu	Asp	Glu	Ser	Pro	Val	Phe	Ala	Ala	Arg	Ile	Ala	Glu	Cys	610	615	620	
Glu	Gln	Ala	Leu	Ser	Ala	Tyr	Val	Asp	Trp	Ser	Leu	Thr	Asp	Val	Leu	625	630	635	640
Arg	Gly	Asp	Gly	Ser	Glu	Leu	Ala	Arg	Ile	Asp	Val	Val	Gln	Pro	Val	645	650	655	
Leu	Trp	Ala	Val	Met	Val	Ala	Leu	Ala	Ala	Val	Trp	Ala	Asp	Gln	Gly	660	665	670	
Ile	Glu	Pro	Ala	Ala	Val	Val	Gly	His	Ser	Gln	Gly	Glu	Ile	Ala	Ala	675	680	685	
Ala	Cys	Val	Val	Gly	Ala	Ile	Ser	Leu	Asp	Glu	Ala	Ala	Arg	Ile	Val	690	695	700	
Ala	Val	Arg	Ser	Val	Leu	Leu	Arg	Gln	Leu	Ser	Gly	Arg	Gly	Gly	Met	705	710	715	720
Ala	Ser	Leu	Gly	Met	Gly	Gln	Glu	Gln	Ala	Ala	Asp	Leu	Ile	Asp	Gly	725	730	735	
His	Pro	Gly	Val	Val	Val	Ala	Ala	Val	Asn	Gly	Pro	Ser	Ser	Thr	Val	740	745	750	
Ile	Ser	Gly	Pro	Pro	Glu	Gly	Ile	Ala	Ala	Val	Val	Ala	Asp	Ala	Gln	755	760	765	
Glu	Arg	Gly	Leu	Arg	Ala	Arg	Ala	Val	Ala	Ser	Asp	Val	Ala	Gly	His	770	775	780	
Gly	Pro	Gln	Leu	Asp	Ala	Ile	Leu	Asp	Gln	Leu	Thr	Glu	Gly	Leu	Ala	785	790	795	800
Gly	Ile	Arg	Pro	Ala	Ala	Thr	Asp	Val	Ala	Phe	Tyr	Ser	Thr	Val	Thr	805	810	815	
Ala	Gly	His	Leu	Thr	Asp	Thr	Thr	Glu	Leu	Asp	Thr	Ala	Tyr	Trp	Val	820	825	830	
Arg	Asn	Val	Arg	Arg	Thr	Val	Arg	Phe	Ala	Asp	Thr	Ile	Asp	Ala	Leu	835	840	845	
Leu	Ala	Asp	Gly	Tyr	Arg	Leu	Phe	Ile	Glu	Val	Ser	Pro	His	Pro	Val	850	855	860	
Leu	Asn	Leu	Ala	Leu	Glu	Gly	Leu	Ile	Glu	Arg	Ala	Ala	Val	Pro	Ala	865	870	875	880
Thr	Val	Val	Pro	Thr	Leu	Arg	Arg	Asp	His	Gly	Asp	Thr	Thr	Gln	Leu	885	890	895	

Ala Arg Ala Ala Ala His Ala Phe Ala Ala Gly Ala Asp Val Asp Trp
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 Arg Arg Trp Phe Pro Ala Asp Pro Ala Pro Arg Thr Val Asp Leu Pro
 915 920 925
 Thr Tyr Ala Phe Gln Arg Gln Asp Phe Trp Pro Ala Pro Ala Gly Gly
 930 935 940
 Arg Ser Gly Asp Pro Ala Gly Leu Gly Leu Ala Ala Ser Gly His Pro
 945 950 955 960
 Leu Leu Gly Ala Ser Val Gly Leu Ala Ser Gly Asp Val His Leu Leu
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 Ser Gly Arg Val Ser Arg Gln Ser Ala Ala Trp Leu Asp Asp His Val
 980 985 990
 Val Ala Gly Gln Ala Leu Val Pro Gly Ala Ala Gln Val Glu Trp Val
 995 1000 1005
 Leu Arg Ala Gly Asp Asp Ala Gly Cys Ser Ala Leu Glu Glu Leu Thr
 1010 1015 1020
 Leu Gln Thr Pro Leu Val Leu Pro Asp Thr Gly Gly Leu Arg Ile Gln
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 Val Val Val Glu Ala Ala Asp Ala His Gly Arg Arg Asp Val Arg Leu
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 Phe Ser Arg Pro Asp Asp Asp Asp Ala Phe Ala Ser Thr His Pro Trp
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 Thr Cys His Ala Thr Gly Val Leu Ala Pro Ala Pro Thr Asp Gly Thr
 1075 1080 1085
 Asn Gly Thr Arg Asp Ala Ala Asp Thr Leu Asp Gly Ala Trp Pro Pro
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 Ala Asp Ala Glu Pro Val Pro Ala Asp Asp Leu Tyr Ala Gln Ala Asp
 1105 1110 1115 1120
 Arg Thr Gly Tyr Gly Tyr Gly Pro Ala Phe Arg Gly Val Arg Ala Leu
 1125 1130 1135
 Trp Arg His Gly Lys Asp Val Leu Ala Glu Val Thr Leu Pro Lys Glu
 1140 1145 1150
 Ala Gly Asp Pro Asp Gly Phe Gly Ile His Pro Ala Leu Leu Asp Ala
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 Val Leu Gln Pro Ala Ala Leu Leu Leu Pro Pro Thr Asp Ala Glu Gln
 1170 1175 1180
 Val Trp Leu Pro Phe Ala Trp Asn Asp Val Ala Leu His Ala Val Arg
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 Ala Thr Thr Val Arg Val Arg Leu Thr Pro Leu Gly Glu Arg Ile Asp
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 Gln Gly Leu Arg Ile Thr Val Ala Asp Ala Val Gly Ala Pro Val Leu
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 Thr Val Arg Asp Leu Arg Ser Arg Pro Thr Asp Thr Gly Arg Leu Ala
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Ala Ala Ala Thr Arg Asp Arg His Gly Leu Phe Asp Leu Glu Trp Ile
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 Ser Glu Gly Trp Val Thr Leu Gly Glu Asp Ala Ala Ser Leu Ala Asp
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 Leu Leu Ala Ser Val Glu Ala Gly Ala Pro Ala Pro Gln Leu Val Ala
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 Ala Pro Val Glu Pro Asp Arg Thr Asp Asp Gly Leu Ala Leu Ala Thr
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 His Val Leu Asp Leu Val Gln Thr Trp Leu Ala Ser Pro Leu His Asp
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 Ser Arg Leu Val Leu Val Thr Arg Gly Ala Val Thr Asp Ala Asp Val
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 Asp Val Ala Ala Ala Val Trp Gly Leu Val Arg Ser Ala Gln Ser
 1365 1370 1375
 Glu His Pro Gly Arg Phe Thr Leu Ile Asp Leu Gly Pro Asp Asp Thr
 1380 1385 1390
 Leu Ala Ala Ala Met Gln Ala Ala His Leu Glu Glu Pro Gln Leu Ala
 1395 1400 1405
 Val His Gly Gly Glu Ile Arg Val Pro Arg Leu Val Arg Ala Thr Thr
 1410 1415 1420
 Asp Pro Thr Ala Pro Asn Gly Thr Pro Glu Ala Asp Arg Thr Ala Asp
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 Pro Ser Glu Gly Leu His Arg Asn Gly Thr Val Leu Ile Thr Gly Gly
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 Thr Gly Val Leu Gly Arg Leu Val Ala Glu His Leu Val Thr Glu Trp
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 1475 1480 1485
 Gly Ser Ala Glu Leu Arg Ala Arg Leu Ser Glu Leu Gly Ala Ser Val
 1490 1495 1500
 Glu Ile Ala Pro Ala Asp Val Gly Asp Ala Glu Ala Val Ala Ala Leu
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 Ile Ala Ser Val Asp Pro Ala His Pro Leu Thr Gly Val Ile His Ala
 1525 1530 1535
 Ala Gly Val Leu Asp Asp Ala Val Ile Thr Ala Gln Thr Pro Glu Ser
 1540 1545 1550
 Leu Ala Arg Val Trp Ala Thr Lys Ala Thr Ala Ala Arg His Leu His
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 Glu Ala Thr Arg Glu Thr Pro Leu Asp Phe Phe Val Val Phe Ser Ser
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 Ala Ala Ala Ser Leu Gly Ser Pro Gly Gln Ala Asn Tyr Ala Ala Ala
 1585 1590 1595 1600

Asn Ala Tyr Cys Asp Ala Leu Val Gln His Arg Arg Ala Gln Gly Leu
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 Ala Gly Leu Ser Ile Ala Trp Gly Leu Trp Gln Ala Thr Ser Gly Met
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 Thr Gly Gln Leu Ser Glu Thr Asp Leu Ala Arg Met Lys Arg Thr Gly
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 Phe Ala Ala Leu Thr Asp Glu Gly Gly Leu Ala Leu Leu Asp Ala Ala
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 Arg Ala His Asp Arg Ala Tyr Val Val Ala Ala Asp Leu Asp Pro Arg
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 Ala Val Thr Asp Gly Leu Ser Pro Leu Leu Arg Ala Leu Thr Ala Pro
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 Ala Thr Arg Arg Arg Val Ala Ser Glu Gly Leu Ala Asp Gly Ala Leu
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 Ala Ala Arg Val Gly Val Asp Ile Ala Phe Lys Asp Leu Gly Phe Asp
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 Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Ser Ala Ala Cys Asp
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 Val Arg Leu Pro Ala Thr Leu Ile Phe Asp His Pro Thr Pro Gln Ala
 1780 1785 1790
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 1795 1800 1805
 Thr Thr Val Asn Ala Thr Ala Pro Ala Ala Ala His Val Ala Ala Gly
 1810 1815 1820
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 1825 1830 1835 1840
 Thr Cys Arg Phe Pro Gly Gly Val Ala Ser Pro Asp Asp Leu Trp Asp
 1845 1850 1855
 Leu Leu Asp Ala Arg Lys Asp Ala Met Gly Ala Phe Pro Thr Asp Arg
 1860 1865 1870
 Gly Trp Asp Leu Glu Arg Leu Phe His Pro Asp Pro Asp His Pro Gly
 1875 1880 1885
 Thr Ser Tyr Thr Asp Gln Gly Gly Phe Leu Pro Asp Ala Gly Asp Phe
 1890 1895 1900
 Asp Ala Ala Phe Phe Gly Ile Asn Pro Arg Glu Ala Leu Ala Met Asp
 1905 1910 1915 1920
 Pro Gln Gln Arg Leu Leu Leu Glu Ala Ser Trp Glu Val Leu Glu Arg
 1925 1930 1935
 Ala Gly Ile Asp Pro Thr Thr Leu Lys Gly Thr Pro Thr Gly Thr Tyr
 1940 1945 1950

Val Gly Leu Met Tyr His Asp Tyr Ala Lys Ser Phe Pro Thr Ala Asp
 1955 1960 1965
 Ala Gln Leu Glu Gly Tyr Ser Tyr Leu Ala Ser Thr Gly Ser Met Val
 1970 1975 1980
 Ser Gly Arg Val Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Val Thr
 1985 1990 1995 2000
 Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ser Ile His Leu Ala Thr
 2005 2010 2015
 Gln Ala Leu Arg His Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Val
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 Met Val Met Ala Met Arg His Gly Val Val Pro Ala Ser Leu His Val
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 Val Glu Ser Val Pro Asp Gly Leu Glu Glu Asp Ser Val Ser Val Gly
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 2275 2280 2285
 Val Ser Ala Arg Ser Pro Gln Ala Leu Arg Asp Gln Ala Leu Arg Leu
 2290 2295 2300

Arg Asp Phe Ala Ser Asp Ala Ser Phe Arg Ala Pro Leu Ala Asp Val
 2305 2310 2315 2320
 Gly Trp Ser Leu Leu Lys Thr Arg Ala Leu His Glu His Arg Ala Val
 2325 2330 2335
 Val Val Gly Ala Glu Arg Ala Glu Leu Ile Ala Ala Leu Glu Ala Leu
 2340 2345 2350
 Ala Thr Gly Glu Pro His Ala Ala Leu Val Gly Pro Ala Cys Ser Gln
 2355 2360 2365
 Ala Arg Val Gly Gly Asp Asp Val Val Trp Leu Phe Ser Gly Gln Gly
 2370 2375 2380
 Ser Gln Leu Val Gly Met Gly Ala Gly Leu Tyr Glu Arg Phe Pro Val
 2385 2390 2395 2400
 Phe Ala Ala Ala Phe Asp Glu Val Cys Gly Leu Leu Glu Gly Pro Leu
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 Gly Val Glu Ala Gly Gly Leu Arg Glu Val Val Phe Arg Gly Pro Arg
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 Gln Val Gly Leu Ala Arg Leu Trp Glu Ser Val Gly Val Arg Pro Asp
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 Val Val Leu Gly His Ser Ile Gly Glu Ile Ala Ala Ala His Val Ala
 2465 2470 2475 2480
 Gly Val Phe Asp Leu Ala Asp Ala Cys Arg Val Val Gly Ala Arg Ala
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 Arg Leu Met Gly Gly Leu Pro Glu Gly Gly Ala Met Cys Ala Val Gln
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 Ala Thr Pro Ala Glu Leu Ala Ala Asp Val Asp Gly Ser Ala Val Ser
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 Asp Glu Val Asp Arg Ile Ala Gly Val Trp Arg Glu Arg Gly Arg Lys
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 Gln Pro Ser Ile Pro Leu Met Ser Asn Val Ser Gly Glu Arg Ala Gly
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Thr Leu Asp Glu Ser Asp Ser Gln Glu Ser Val Leu Val Ala Ser Leu
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 Ala Thr Leu His Pro Leu Leu Ala Ala Arg Phe Met Asp Gly Ser Glu
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 Asp Asp Gln Leu Tyr Val Pro Phe Gly Trp Ala Gly Val Ser Leu Arg
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 Ala Val Gly Ala Thr Thr Val Arg Val Arg Leu Arg Pro Val Gly Glu
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 Ser Val Asp Gln Gly Leu Ser Val Thr Val Thr Asp Ala Thr Gly Gly
 2995 3000 3005

Pro Val Leu Ser Val Asp Ser Leu Gln Thr Arg Pro Val Lys Pro Ser
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 Gln Leu Ala Ala Ala Gln Gln Pro Asp Val Arg Gly Leu Phe Thr Val
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 Asp Gly Asp Gly Asp Asp Gln Gly Pro Asp Leu Asn Gly Arg His Leu
 3170 3175 3180
 Pro His Ala Thr Leu Arg His Ala Ala Glu Glu Leu Asp Glu Pro Gln
 3185 3190 3195 3200
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 Cys Pro Glu Ala Leu Glu Pro Leu Ala Pro Gly Gln Val Arg Ile Ala
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 Met Val Pro Ala Tyr Gly Ala Met Gly Gly Glu Gly Ala Gly Val Val
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 Thr Glu Val Gly Pro Glu Val Thr His Val Ser Val Gly Asp Arg Val
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 Arg Met Val Thr Pro Val Pro Gln Gly Trp Asp Met Arg Glu Ala Ala
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 Gly Ile Pro Ala Ala Phe Leu Thr Ala Trp Tyr Gly Leu Val Glu Leu
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Ala Gly Leu Lys Ala Gly Glu Arg Val Leu Val His Ala Ala Thr Gly
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 Gly Val Gly Met Ala Ala Val Gln Ile Ala Arg His Val Gly Ala Glu
 3380 3385 3390
 Val Phe Ala Thr Ala Ser Pro Gly Lys His Ala Val Leu Glu Glu Met
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 Gly Ile Asp Ala Ala His Arg Ala Ser Ser Arg Asp Leu Ala Phe Glu
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 Gly Thr Phe Arg Glu Ala Thr Gly Gly Arg Gly Met Asp Val Val Leu
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 Asn Ser Leu Ala Gly Glu Phe Ile Asp Ala Ser Leu Arg Leu Leu Gly
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 Asp Gly Gly Arg Phe Leu Glu Met Gly Lys Thr Asp Val Arg Ala Ala
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 Glu Glu Val Ala Ala Glu His Ala Asp Val Ser Tyr Thr Ala Tyr Asp
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 3490 3495 3500
 Leu Val Glu Leu Phe Ala Ser Glu Arg Leu Lys Pro Leu Pro Val Arg
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 Pro Glu Gly Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly Gln
 3555 3560 3565
 Val Val Ala Glu His Leu Val Arg Glu Trp Gly Val Arg His Leu Leu
 3570 3575 3580
 Leu Ala Ser Arg Arg Gly Pro Glu Ala Pro Gly Ser Asp Glu Leu Ala
 3585 3590 3595 3600
 Ser Lys Leu Thr Gly Leu Gly Ala Glu Val Thr Ile Val Ala Ala Asp
 3605 3610 3615
 Val Ser Asp Pro Ala Ser Val Val Glu Leu Val Gly Lys Thr Asp Pro
 3620 3625 3630
 Ser His Pro Leu Thr Gly Val Val His Ala Ala Gly Val Leu Glu Asp
 3635 3640 3645
 Gly Val Val Thr Ala Gln Thr Pro Glu Gly Leu Ala Arg Val Trp Ala
 3650 3655 3660
 Ala Lys Ala Ala Ala Ala Asn Leu His Glu Ala Thr Arg Glu Met
 3665 3670 3675 3680
 Arg Leu Gly Leu Phe Val Val Phe Ser Ser Ala Ala Ala Thr Leu Gly
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 Ser Pro Gly Gln Ala Asn Tyr Ala Ala Ala Asn Ala Tyr Cys Asp Ala
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Leu Met Gln His Arg Arg Ala Val Gly Gln Val Gly Leu Ser Val Gly
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 Trp Gly Leu Trp Glu Ala Pro Asp Ala Lys Pro Gly Val Ala Ala Asp
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 Ala Lys Ala Ser Ala Ala Thr Val Gly Lys Ala Ser Ala Leu Ser Asp
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 Gly Met Thr Gly Gly Leu Thr Asp Thr Asp Val Ala Arg Met Ala Arg
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 Ile Gly Val Lys Gly Met Ser Asn Ala His Gly Leu Ala Leu Phe Asp
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 Ala Ala His Arg His Gly Arg Pro His Leu Val Gly Phe Asn Leu Asp
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 Arg Gly Leu Ala Thr Pro Thr Ala Gly Gly Ala Ser Arg Pro Thr Ala
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 Thr Ala Gly Gly Gln Pro Ala Asp Leu Ala Gly Arg Leu Ala Ala Leu
 3860 3865 3870
 Ser Pro Ser Asp Arg His His Thr Leu Val Arg Leu Ile Arg Glu Gln
 3875 3880 3885
 Ala Ala Thr Val Leu Gly His His Pro Asp Ser Leu Thr Thr Gly Ser
 3890 3895 3900
 Thr Phe Lys Glu Leu Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg
 3905 3910 3915 3920
 Asn Arg Leu Ser Ala Ala Thr Gly Leu Arg Leu Pro Ala Gly Leu Val
 3925 3930 3935
 Phe Asp His Pro Asp Ala Asp Ile Leu Ala Glu His Leu Gly Ala Gln
 3940 3945 3950
 Leu Ala Pro Asp Gly Asp Thr Pro Ala Gly Ala Glu Ala Thr Asp Pro
 3955 3960 3965
 Val Leu Arg Asp Leu Ala Lys Leu Glu Asn Ala Leu Ser Ser Thr Leu
 3970 3975 3980
 Val Glu His Leu Asp Ala Asp Ala Val Thr Ala Arg Leu Glu Ala Leu
 3985 3990 3995 4000
 Leu Ser Asn Trp Lys Ala Ala Ser Ala Ala Pro Gly Ser Gly Ser Thr
 4005 4010 4015
 Lys Glu Gln Leu Gln Val Ala Thr Thr Asp Gln Val Leu Asp Phe Ile
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 Asp Lys Glu Leu Gly Val
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 <211> 4106
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 23

Met	Ala	Ser	Glu	Glu	Glu	Leu	Val	Asp	Tyr	Leu	Lys	Arg	Val	Ala	Ala
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Glu	Leu	His	Asp	Thr	Arg	Gln	Arg	Leu	Arg	Glu	Val	Glu	Asp	Arg	Arg
			20					25					30		
Gln	Glu	Pro	Val	Ala	Val	Val	Gly	Met	Ala	Cys	Arg	Phe	Pro	Gly	Gly
		35					40					45			
Ile	Glu	Thr	Pro	Glu	Gly	Leu	Trp	Glu	Leu	Val	Ala	Ala	Gly	Asp	Asp
	50					55					60				
Ala	Ile	Glu	Pro	Phe	Pro	Thr	Asp	Arg	Gly	Trp	Asp	Leu	Glu	Gly	Ile
65					70					75					80
Tyr	His	Pro	Asp	Pro	Asp	His	Pro	Gly	Thr	Cys	Tyr	Val	Arg	Glu	Gly
			85						90					95	
Gly	Phe	Leu	Ala	Ala	Pro	Asp	Arg	Phe	Asp	Ser	Asp	Phe	Phe	Gly	Phe
			100					105					110		
Ser	Pro	Arg	Glu	Ala	Leu	Ala	Ser	Ser	Pro	Gln	Leu	Arg	Leu	Leu	Leu
		115					120					125			
Glu	Thr	Ser	Trp	Glu	Ala	Leu	Glu	Arg	Ala	Gly	Ile	Asn	Pro	Ala	Ser
	130					135					140				
Leu	Lys	Gly	Ser	Pro	Thr	Gly	Val	Tyr	Val	Gly	Ala	Ala	Thr	Thr	Gly
145					150					155					160
Asn	Gln	Thr	Gln	Gly	Asp	Pro	Gly	Gly	Lys	Ala	Thr	Glu	Gly	Tyr	Ala
			165						170					175	
Gly	Thr	Ala	Pro	Ser	Val	Leu	Ser	Gly	Arg	Leu	Ser	Phe	Thr	Leu	Gly
			180					185					190		
Leu	Glu	Gly	Pro	Ala	Val	Thr	Val	Glu	Thr	Ala	Cys	Ser	Ser	Ser	Leu
		195					200					205			
Val	Ala	Met	His	Leu	Ala	Ala	Asn	Ala	Leu	Arg	Gln	Gly	Glu	Cys	Asp
	210					215					220				
Leu	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val	Met	Ser	Thr	Pro	Glu	Val	Phe
225					230					235					240
Thr	Gly	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ala	Pro	Asp	Gly	Arg	Cys	Lys
				245					250					255	
Pro	Phe	Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu	Gly	Ala	Gly
			260					265					270		
Leu	Ile	Leu	Leu	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	Lys	Gly	His	Lys
		275					280					285			
Val	Leu	Ala	Val	Ile	Arg	Gly	Ser	Ala	Ile	Asn	Gln	Asp	Gly	Ala	Ser
	290					295					300				
Asn	Gly	Phe	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Arg	Arg	Val	Ile	Arg
305					310					315					320

Gln	Ala	Leu	Ser	Ser	Ala	His	Leu	Ser	Thr	Ser	Glu	Ile	Asp	Val	Val		
				325					330					335			
Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Glu		
			340					345					350				
Ala	Leu	Ile	Ala	Thr	Tyr	Gly	Lys	Glu	Arg	Glu	Asp	Asp	Arg	Pro	Leu		
		355					360					365					
Trp	Leu	Gly	Ser	Val	Lys	Ser	Asn	Ile	Gly	His	Thr	Gln	Ala	Ala	Ala		
	370					375					380						
Gly	Val	Ala	Gly	Val	Ile	Lys	Met	Val	Met	Ala	Leu	Gln	Arg	Glu	Leu		
	385				390					395					400		
Leu	Pro	Ala	Thr	Leu	Asn	Val	Asp	Glu	Pro	Thr	Pro	His	Val	Gln	Trp		
				405					410					415			
Glu	Gly	Gly	Gly	Val	Arg	Leu	Leu	Thr	Glu	Pro	Val	Pro	Trp	Ser	Arg		
			420					425					430				
Gly	Glu	Arg	Pro	Arg	Arg	Ala	Gly	Ile	Ser	Ser	Phe	Gly	Ile	Ser	Gly		
		435					440					445					
Thr	Asn	Ala	His	Val	Val	Leu	Glu	Glu	Ala	Pro	Pro	Glu	Glu	Asp	Val		
	450					455					460						
Pro	Gly	Pro	Val	Ala	Ala	Glu	Pro	Glu	Gly	Val	Val	Pro	Trp	Val	Val		
	465				470					475					480		
Ser	Ala	Arg	Thr	Glu	Glu	Ala	Leu	Ser	Glu	Gln	Ala	Arg	Arg	Leu	Gly		
				485					490					495			
Glu	Phe	Val	Ala	Asp	Thr	Asp	Pro	Ser	Thr	Ala	Asp	Val	Gly	Trp	Ser		
			500					505					510				
Leu	Thr	Thr	Ser	Arg	Ala	Ile	Leu	Glu	His	Arg	Ala	Val	Val	Val	Gly		
		515					520					525					
Arg	Asp	Arg	Asp	Ala	Leu	Thr	Ala	Gly	Leu	Ala	Ala	Leu	Ala	Ala	Gly		
	530					535					540						
Glu	Glu	Ser	Ala	Asp	Val	Val	Ala	Gly	Val	Ala	Gly	Asp	Val	Gly	Pro		
	545				550					555					560		
Gly	Pro	Val	Leu	Val	Phe	Pro	Gly	Gln	Gly	Ser	Gln	Trp	Val	Gly	Met		
			565					570						575			
Gly	Ala	Gln	Leu	Leu	Asp	Glu	Ser	Pro	Val	Phe	Ala	Ala	Arg	Ile	Ala		
			580					585					590				
Glu	Cys	Glu	Gln	Ala	Leu	Ser	Ala	Tyr	Val	Asp	Trp	Ser	Leu	Ser	Ala		
	595					600						605					
Val	Leu	Arg	Gly	Asp	Gly	Ser	Glu	Leu	Ser	Arg	Val	Glu	Val	Val	Gln		
	610					615					620						
Pro	Val	Leu	Trp	Ala	Val	Met	Val	Ser	Leu	Ala	Ala	Val	Trp	Ala	Asp		
	625				630					635					640		
Tyr	Gly	Val	Thr	Pro	Ala	Ala	Val	Ile	Gly	His	Ser	Gln	Gly	Glu	Met		
				645				650						655			
Ala	Ala	Ala	Cys	Val	Ala	Gly	Ala	Leu	Ser	Leu	Glu	Asp	Ala	Ala	Arg		
			660					665					670				

Val Val Ala Val Arg Ser Asp Ala Leu Arg Gln Leu Met Gly Gln Gly
675 680 685
Asp Met Ala Ser Leu Gly Ala Ser Ser Glu Gln Ala Ala Glu Leu Ile
690 695 700
Gly Asp Arg Pro Gly Val Cys Ile Ala Ala Val Asn Gly Pro Ser Ser
705 710 715 720
Thr Val Ile Ser Gly Pro Pro Glu His Val Ala Ala Val Val Ala Asp
725 730 735
Ala Glu Glu Arg Gly Leu Arg Ala Arg Val Ile Asp Val Gly Tyr Ala
740 745 750
Ser His Gly Pro Gln Ile Asp Gln Leu His Asp Leu Leu Thr Asp Arg
755 760 765
Leu Ala Asp Ile Arg Pro Ala Thr Thr Asp Val Ala Phe Tyr Ser Thr
770 775 780
Val Thr Ala Glu Arg Leu Thr Asp Thr Thr Ala Leu Asp Thr Asp Tyr
785 790 795 800
Trp Val Thr Asn Leu Arg Gln Pro Val Arg Phe Ala Asp Thr Ile Asp
805 810 815
Ala Leu Leu Ala Asp Gly Tyr Arg Leu Phe Ile Glu Ala Ser Ala His
820 825 830
Pro Val Leu Gly Leu Gly Met Glu Glu Thr Ile Glu Gln Ala Asp Ile
835 840 845
Pro Ala Thr Val Val Pro Thr Leu Arg Arg Asp His Gly Asp Thr Thr
850 855 860
Gln Leu Thr Arg Ala Ala Ala His Ala Phe Thr Ala Gly Ala Thr Val
865 870 875 880
Asp Trp Arg Arg Trp Phe Pro Ala Asp Pro Thr Pro Arg Thr Ile Asp
885 890 895
Leu Pro Thr Tyr Ala Phe Gln Arg Arg Ser Tyr Trp Leu Pro Val Asp
900 905 910
Gly Val Gly Asp Val Arg Ser Ala Gly Leu Arg Arg Val Glu His Ser
915 920 925
Leu Leu Pro Ala Ala Leu Gly Leu Ala Asp Gly Ala Leu Val Leu Thr
930 935 940
Gly Arg Leu Ala Ala Ser Gly Gly Gly Gly Gly Trp Leu Ala Asp His
945 950 955 960
Ala Val Ala Gly Thr Thr Leu Val Pro Gly Ala Ala Leu Val Glu Trp
965 970 975
Ala Leu Arg Ala Ala Asp Glu Ala Gly Cys Pro Ser Leu Glu Glu Leu
980 985 990
Thr Leu Gln Ala Pro Leu Val Leu Pro Gly Ser Gly Gly Leu Gln Val
995 1000 1005
Gln Val Val Val Gly Pro Ala Asp Gly Gln Gly Gly Arg Arg Glu Val
1010 1015 1020

Arg Val Phe Ser Arg Val Asp Ser Asp Asp Glu Ala Ala Gly Gln Asp
 1025 1030 1035 1040
 Glu Gly Trp Ser Cys His Ala Thr Gly Val Leu Ser Pro Glu Pro Gly
 1045 1050 1055
 Ala Val Pro Asp Gly Leu Ser Gly Gln Trp Pro Pro Thr Gly Ala Glu
 1060 1065 1070
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 1075 1080 1085
 Glu Tyr Gly Pro Ser Phe Arg Gly Leu Arg Ser Val Trp Arg His Gly
 1090 1095 1100
 His Asn Leu Leu Ala Glu Val Glu Leu Pro Glu Gln Ala Gly Ala His
 1105 1110 1115 1120
 Asp Asp Phe Gly Ile His Pro Val Leu Leu Asp Ala Ala Leu His Pro
 1125 1130 1135
 Ala Leu Leu Leu Asp Gln Asn Ala Pro Gly Glu Glu Gln Glu Pro Ala
 1140 1145 1150
 Gln Pro Ala Leu Arg Leu Pro Phe Val Trp Asn Gly Val Ser Leu Trp
 1155 1160 1165
 Ala Thr Gly Ala Ala Thr Val Arg Val Arg Leu Ala Pro His Gly Gly
 1170 1175 1180
 Gly Glu Thr Asp Asp Ser Ala Gly Leu Arg Val Thr Val Ala Asp Ala
 1185 1190 1195 1200
 Thr Gly Ala Pro Val Leu Ser Val Asp Ser Leu Ala Leu Arg Pro Ala
 1205 1210 1215
 Asp Pro Glu Leu Leu Arg Thr Ala Gly Arg Ala Gly Ser Gly Thr Asn
 1220 1225 1230
 Gly Leu Phe Thr Val Glu Trp Thr Ala Leu Pro Pro Ala Asp Val Ala
 1235 1240 1245
 Asp His Ala Ala Gly Asp Gly Trp Ala Val Leu Gly Gln Asp Val Pro
 1250 1255 1260
 Asp Trp Ala Gly Ala Asp Met Pro Arg His Pro Asp Met Ala Ser Leu
 1265 1270 1275 1280
 Ser Ala Ala Leu Asp Glu Gly Thr Gln Ala Pro Ala Ala Val Phe Val
 1285 1290 1295
 Glu Thr Thr Ala Thr Ser His Ala Thr Pro Asn Thr Ala Ala Asp Val
 1300 1305 1310
 Thr Leu Asp Ala Ser Gly Arg Ala Val Ala Glu Arg Thr Leu His Leu
 1315 1320 1325
 Leu Arg Asp Trp Leu Ala Glu Pro Arg Leu Ala Glu Thr Arg Leu Val
 1330 1335 1340
 Leu Ile Thr His His Ala Val Thr Thr Pro Ala Asp Asp Asp Val Asn
 1345 1350 1355 1360
 Ala Ala Pro Leu Asp Val Pro Ala Ala Ala Leu Trp Gly Leu Ile Arg
 1365 1370 1375

Ser Ala Gln Ala Glu His Pro Asp Arg Phe Val Leu Leu Asp Thr Asp
 1380 1385 1390
 Ala Lys Ala Asn Thr Asp Pro Gly Pro Asp Thr Ser Thr Asp His Ser
 1395 1400 1405
 Thr Ala Ser Gly Thr Tyr Arg Thr Val Ile Ala Arg Ala Leu Ala Thr
 1410 1415 1420
 Gly Glu Pro Gln Leu Ala Val Arg Ala Gly Glu Leu Leu Ala Pro Arg
 1425 1430 1435 1440
 Leu Ala Arg Ala Ala Thr Pro Thr Pro Glu Thr Pro Thr Pro Glu Thr
 1445 1450 1455
 Gln Pro Asp Thr Gly Ser Gly Ser Glu Ala Gly Ala Gly Ser Gly Ser
 1460 1465 1470
 Gly Pro Gly Ala Thr Leu Asp Pro Asp Gly Thr Val Leu Ile Ala Gly
 1475 1480 1485
 Gly Thr Gly Met Met Gly Gly Leu Val Ala Glu His Leu Val Arg Ala
 1490 1495 1500
 Trp Ser Val Arg His Leu Leu Leu Val Ser Arg Gln Gly Pro Asp Ala
 1505 1510 1515 1520
 Pro Asp Ala Arg Asp Leu Ala Asp Arg Leu Val Gly Leu Gly Ala Thr
 1525 1530 1535
 Val Arg Ile Val Ala Ala Asp Leu Thr Asp Gly Arg Ala Thr Ala Asp
 1540 1545 1550
 Leu Val Ala Ser Val Asp Pro Ala His Pro Leu Thr Gly Val Ile His
 1555 1560 1565
 Ala Ala Gly Val Leu Asp Asp Ala Val Val Thr Ala Gln Thr Ser Asp
 1570 1575 1580
 Gln Leu Ala Arg Val Trp Ala Ala Lys Ala Ser Val Ala Ala Asn Leu
 1585 1590 1595 1600
 Asp Ala Ala Thr Ser Glu Leu Pro Leu Gly Leu Phe Leu Met Phe Ser
 1605 1610 1615
 Ser Ala Ala Gly Val Leu Gly Asn Ala Gly Gln Ala Gly Tyr Ala Ala
 1620 1625 1630
 Ala Asn Ala Phe Val Asp Ala Leu Val Gly Arg Arg Arg Ala Thr Gly
 1635 1640 1645
 Leu Pro Gly Leu Ser Ile Ala Trp Gly Leu Trp Ala Arg Gly Ser Ala
 1650 1655 1660
 Met Thr Arg His Leu Asp Asp Ala Asp Leu Ala Arg Leu Arg Ala Gly
 1665 1670 1675 1680
 Gly Val Lys Pro Leu Leu Asp Glu Gln Gly Leu Ala Leu Leu Asp Ala
 1685 1690 1695
 Ala Arg Ala Thr Ala Ala His Thr Ser Leu Val Val Ala Ala Gly Ile
 1700 1705 1710
 Asp Val Arg Gly Leu Asn Arg Asp Asp Val Pro Ala Ile Leu Arg Asp
 1715 1720 1725

Leu Ala Gly Arg Thr Arg Arg Arg Ala Ala Ala Asp Ser Thr Val Asp
 1730 1735 1740
 Gln Ala Ala Leu Glu Arg Arg Leu Thr Gly Leu Asp Glu Ala Glu Arg
 1745 1750 1755 1760
 Arg Ala Val Val Thr Asp Val Val Arg Glu Cys Val Ala Ala Val Leu
 1765 1770 1775
 Gly His Arg Ser Ala Ala Asp Val Arg Thr Glu Ala Asn Phe Lys Asp
 1780 1785 1790
 Leu Gly Phe Asp Ser Leu Thr Ala Val Gln Leu Arg Asn Arg Leu Ser
 1795 1800 1805
 Ala Ala Ser Gly Leu Arg Leu Pro Ala Thr Leu Ala Phe Asp His Pro
 1810 1815 1820
 Thr Pro Gln Ala Leu Ala Ala Tyr Leu Gly Thr Arg Leu Ser Gly Arg
 1825 1830 1835 1840
 Thr Ala Thr Pro Val Ala Pro Val Ala Pro Ser Ala Ala Ala Thr Asp
 1845 1850 1855
 Glu Pro Val Ala Ile Val Ala Met Ala Cys Lys Tyr Pro Gly Gly Ala
 1860 1865 1870
 Thr Ser Pro Glu Gly Leu Trp Asp Leu Val Ala Glu Gly Val Asp Ala
 1875 1880 1885
 Val Gly Ala Phe Pro Thr Gly Arg Gly Trp Asp Leu Glu Arg Leu Phe
 1890 1895 1900
 His Pro Asp Pro Asp His Pro Gly Thr Ser Tyr Ala Asp Glu Gly Ala
 1905 1910 1915 1920
 Phe Leu Pro Asp Ala Gly Asp Phe Asp Ala Ala Phe Phe Gly Ile Asn
 1925 1930 1935
 Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu
 1940 1945 1950
 Ala Ser Trp Glu Val Leu Glu Arg Ala Gly Ile Asp Pro Thr Thr Leu
 1955 1960 1965
 Lys Gly Thr Pro Thr Gly Thr Tyr Val Gly Val Met Tyr His Asp Tyr
 1970 1975 1980
 Ala Ala Gly Leu Ala Gln Asp Ala Gln Leu Glu Gly Tyr Ser Met Leu
 1985 1990 1995 2000
 Ala Gly Ser Gly Ser Val Val Ser Gly Arg Val Ala Tyr Thr Leu Gly
 2005 2010 2015
 Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu
 2020 2025 2030
 Val Ser Ile His Leu Ala Ala Gln Ala Leu Arg Gln Gly Glu Cys Thr
 2035 2040 2045
 Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr Pro Glu Val Phe
 2050 2055 2060
 Thr Gly Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys
 2065 2070 2075 2080

Pro	Phe	Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu	Gly	Val	Gly	2085	2090	2095
Val	Leu	Leu	Leu	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	His	Gly	Arg	Arg	2100	2105	2110
Val	Leu	Gly	Val	Val	Arg	Gly	Ser	Ala	Val	Asn	Gln	Asp	Gly	Ala	Ser	2115	2120	2125
Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Glu	Arg	Val	Ile	Arg	2130	2135	2140
Gln	Ala	Leu	Ala	Ser	Gly	Gly	Leu	Ser	Ser	Val	Asp	Val	Asp	Val	Val	2145	2150	2160
Glu	Gly	His	Gly	Thr	Gly	Thr	Thr	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gln	2165	2170	2175
Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Gly	Arg	Pro	Val	Asp	Arg	Pro	Leu	2180	2185	2190
Trp	Leu	Gly	Ser	Val	Lys	Ser	Asn	Ile	Gly	His	Thr	Gln	Ala	Ala	Ala	2195	2200	2205
Gly	Val	Ala	Gly	Val	Ile	Lys	Met	Val	Met	Ala	Met	Arg	His	Gly	Val	2210	2215	2220
Val	Pro	Ala	Ser	Leu	His	Val	Asp	Val	Pro	Ser	Pro	His	Val	Glu	Trp	2225	2230	2240
Asp	Ser	Gly	Ala	Val	Arg	Leu	Ala	Val	Glu	Ser	Val	Pro	Trp	Pro	Glu	2245	2250	2255
Val	Glu	Gly	Arg	Pro	Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Ala	Ser	2260	2265	2270
Gly	Thr	Asn	Ala	His	Val	Ile	Val	Glu	Ser	Val	Pro	Asp	Gly	Leu	Gly	2275	2280	2285
Glu	Asp	Ser	Val	Ser	Val	Ser	Gly	Glu	Ala	Pro	Glu	Thr	Glu	Thr	Asp	2290	2295	2300
Gly	Arg	Leu	Val	Pro	Trp	Val	Val	Ser	Ala	Arg	Ser	Pro	Gln	Ala	Leu	2305	2310	2320
Arg	Asp	Gln	Ala	Leu	Arg	Leu	Arg	Asp	Ala	Val	Ala	Ala	Asp	Ser	Thr	2325	2330	2335
Val	Ser	Val	Gln	Asp	Val	Gly	Trp	Ser	Leu	Leu	Lys	Thr	Arg	Ala	Leu	2340	2345	2350
Phe	Glu	Gln	Arg	Ala	Val	Val	Val	Gly	Arg	Glu	Arg	Ala	Glu	Leu	Leu	2355	2360	2365
Ser	Gly	Leu	Ala	Val	Leu	Ala	Ala	Gly	Glu	Glu	His	Pro	Ala	Val	Thr	2370	2375	2380
Arg	Ser	Arg	Glu	Asp	Gly	Val	Ala	Ala	Ser	Gly	Ala	Val	Val	Trp	Leu	2385	2390	2400
Phe	Ser	Gly	Gln	Gly	Ser	Gln	Leu	Val	Gly	Met	Gly	Ala	Gly	Leu	Tyr	2405	2410	2415
Glu	Arg	Phe	Pro	Val	Phe	Ala	Ala	Ala	Phe	Asp	Glu	Val	Cys	Gly	Leu	2420	2425	2430

Leu Glu Gly Pro Leu Gly Val Glu Ala Gly Gly Leu Arg Glu Val Val
 2435 2440 2445
 Phe Arg Gly Pro Arg Glu Arg Leu Asp His Thr Met Trp Ala Gln Ala
 2450 2455 2460
 Gly Leu Phe Ala Leu Gln Val Gly Leu Ala Arg Leu Trp Glu Ser Val
 2465 2470 2475 2480
 Gly Val Arg Pro Asp Val Val Leu Gly His Ser Ile Gly Glu Ile Ala
 2485 2490 2495
 Ala Ala His Val Ala Gly Val Phe Asp Leu Ala Asp Ala Cys Arg Val
 2500 2505 2510
 Val Gly Ala Arg Ala Arg Leu Met Gly Gly Leu Pro Glu Gly Gly Ala
 2515 2520 2525
 Met Cys Ala Val Gln Ala Thr Pro Ala Glu Leu Ala Ala Asp Val Asp
 2530 2535 2540
 Asp Ser Gly Val Ser Val Ala Ala Val Asn Thr Pro Asp Ser Thr Val
 2545 2550 2555 2560
 Ile Ser Gly Pro Ser Gly Glu Val Asp Arg Ile Ala Gly Val Trp Arg
 2565 2570 2575
 Glu Arg Gly Arg Lys Thr Lys Ala Leu Ser Val Ser His Ala Phe His
 2580 2585 2590
 Ser Ala Leu Met Glu Pro Met Leu Ala Glu Phe Thr Glu Ala Ile Arg
 2595 2600 2605
 Glu Val Lys Phe Thr Arg Pro Lys Val Ser Leu Ile Ser Asn Val Ser
 2610 2615 2620
 Gly Leu Glu Ala Gly Glu Glu Ile Ala Ser Pro Glu Tyr Trp Ala Arg
 2625 2630 2635 2640
 His Val Arg Gln Thr Val Leu Phe Gln Pro Gly Ile Ala Gln Val Ala
 2645 2650 2655
 Ser Thr Ala Gly Val Phe Val Glu Leu Gly Pro Gly Pro Val Leu Thr
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 Thr Ala Ala Gln His Thr Leu Asp Asp Val Thr Asp Arg His Gly Pro
 2675 2680 2685
 Glu Pro Val Leu Val Ser Ser Leu Ala Gly Glu Arg Pro Glu Glu Ser
 2690 2695 2700
 Ala Phe Val Glu Ala Met Ala Arg Leu His Thr Ala Gly Val Ala Val
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 Asp Trp Ser Val Leu Phe Ala Gly Asp Arg Val Pro Gly Leu Val Glu
 2725 2730 2735
 Leu Pro Thr Tyr Ala Phe Gln Arg Glu Arg Phe Trp Leu Ser Gly Arg
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 Ser Gly Gly Gly Asp Ala Ala Thr Leu Gly Leu Val Ala Ala Gly His
 2755 2760 2765
 Pro Leu Leu Gly Ala Ala Val Glu Phe Ala Asp Arg Gly Gly Cys Leu
 2770 2775 2780

Leu Thr Gly Arg Leu Ser Arg Ser Gly Val Ser Trp Leu Ala Asp His
 2785 2790 2795 2800
 Val Val Ala Gly Ala Val Leu Val Pro Gly Ala Ala Leu Val Glu Trp
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 Ala Leu Arg Ala Gly Asp Glu Val Gly Cys Val Thr Val Glu Glu Leu
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 Met Leu Gln Ala Pro Leu Val Val Pro Glu Ala Ser Gly Leu Arg Val
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 Gln Val Val Val Glu Glu Ala Gly Glu Asp Gly Arg Arg Gly Val Gln
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 Ile Tyr Ser Arg Pro Asp Ala Asp Ala Val Ser Gly Asp Asp Ser Trp
 2865 2870 2875 2880
 Ile Cys His Ala Thr Gly Thr Leu Thr Pro Gln His Thr Asp Ala Pro
 2885 2890 2895
 Asn Asp Gly Leu Ala Gly Ala Trp Pro Ala Ala Gly Ala Val Pro Val
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 Asp Leu Ala Gly Phe Tyr Glu Arg Val Ala Asp Ala Gly Tyr Ala Tyr
 2915 2920 2925
 Gly Pro Gly Phe Gln Gly Leu Arg Ala Val Trp Arg His Gly Gln Asp
 2930 2935 2940
 Leu Leu Ala Glu Val Val Leu Pro Glu Ala Ala Gly Ala His Asp Gly
 2945 2950 2955 2960
 Tyr Gly Ile His Pro Ala Leu Leu Asp Ala Thr Leu His Pro Ala Leu
 2965 2970 2975
 Leu Leu Asp Trp Pro Gly Glu Val Gln Asp Asp Asp Gly Lys Val Trp
 2980 2985 2990
 Leu Pro Phe Thr Trp Asn Gln Val Ser Leu Arg Ala Ala Gly Ala Ala
 2995 3000 3005
 Thr Val Arg Val Arg Leu Ser Pro Gly Glu His Asp Glu Ala Glu Arg
 3010 3015 3020
 Glu Val Gln Val Leu Val Ala Asp Ala Thr Gly Thr Asp Val Leu Ser
 3025 3030 3035 3040
 Val Gly Ser Val Thr Leu Arg Pro Ala Asp Ile Arg Gln Leu Gln Ala
 3045 3050 3055
 Val Pro Gly His Asp Asp Gly Leu Phe Ser Val Asp Trp Thr Pro Leu
 3060 3065 3070
 Pro Leu Ser Arg Thr Asp Val Ser Gln Thr Asp Ala Asp Gly Asp Ala
 3075 3080 3085
 Asp Trp Val Val Leu Ser Asp Gly Val Gly Ser Leu Ala Asp Val Val
 3090 3095 3100
 Ser Ala Ala Gly Gly Glu Ala Pro Trp Ala Val Val Ala Pro Val Gly
 3105 3110 3115 3120
 Ala Ser Ala Gly Gly Gly Leu Ala Gly Phe Asp Arg Arg Glu Gly Leu
 3125 3130 3135

Asp Gly Arg Leu Val Val Glu Arg Val Leu Ser Leu Val Gln Glu Phe
 3140 3145 3150
 Leu Ala Ala Pro Glu Leu Ala Glu Ser Arg Leu Leu Val Leu Thr Arg
 3155 3160 3165
 Gly Ala Val Ala Thr Gly Gly Asp Gly Asp Gly Asp Val Asp Ala Ser
 3170 3175 3180
 Ala Ala Ala Val Trp Gly Leu Val Arg Ser Ala Gln Ser Glu Asn Pro
 3185 3190 3195 3200
 Gly Arg Phe Ile Leu Leu Asp Val Asp Met Asp Val Asp Val Asp Val
 3205 3210 3215
 Asp Met Asp Val Asp Val Asp Val Asp Val Asp Val Asp Val Asp Gly
 3220 3225 3230
 Asp Gly Asn Gly Ser Asp Leu Asp Pro Asp Leu Asn Gly Arg Arg Leu
 3235 3240 3245
 Pro His Ala Thr Leu Arg His Ala Ala Glu Glu Leu Asp Glu Pro Gln
 3250 3255 3260
 Leu Ala Leu Arg Asp Gly Gln Leu Leu Val Pro Arg Leu Val Arg Ala
 3265 3270 3275 3280
 Thr Gly Gly Gly Leu Val Val Ala Pro Thr Asp Arg Ala Trp Arg Leu
 3285 3290 3295
 Asp Lys Gly Ser Ala Glu Thr Leu Glu Ser Val Ala Pro Val Ala Tyr
 3300 3305 3310
 Pro Gly Val Met Glu Pro Leu Gly Pro Gly Gln Val Arg Leu Gly Ile
 3315 3320 3325
 His Ala Ala Gly Ile Asn Phe Arg Asp Val Leu Val Ser Leu Gly Met
 3330 3335 3340
 Val Pro Gly Gln Val Gly Leu Gly Gly Glu Gly Ala Gly Val Val Thr
 3345 3350 3355 3360
 Glu Thr Gly Pro Asp Val Thr His Leu Ser Val Gly Asp Arg Val Met
 3365 3370 3375
 Gly Val Leu His Gly Ser Phe Gly Pro Thr Ala Val Ala Asp Thr Arg
 3380 3385 3390
 Met Val Ala Pro Val Pro Gln Gly Trp Asp Met Arg Gln Ala Ala Ala
 3395 3400 3405
 Met Pro Val Ala Tyr Leu Thr Ala Trp Tyr Gly Leu Val Glu Leu Ala
 3410 3415 3420
 Gly Leu Lys Ala Gly Glu Arg Val Leu Ile His Ala Ala Thr Gly Gly
 3425 3430 3435 3440
 Val Gly Met Ala Ala Val Gln Ile Ala Arg His Leu Gly Ala Glu Val
 3445 3450 3455
 Phe Ala Thr Ala Ser Ala Ala Lys His Val Val Leu Glu Glu Met Gly
 3460 3465 3470
 Ile Asp Ala Ala His Arg Ala Ser Ser Arg Asp Leu Ala Phe Glu Asp
 3475 3480 3485

Thr Phe Arg Gln Ala Thr Asp Gly Arg Gly Met Asp Val Val Leu Asn
 3490 3495 3500

Ser Leu Thr Gly Glu Phe Ile Asp Ala Ser Leu Arg Leu Leu Gly Asp
 3505 3510 3515 3520

Gly Gly Arg Phe Leu Glu Met Gly Lys Thr Asp Val Arg Thr Pro Glu
 3525 3530 3535

Glu Val Ala Ala Glu Tyr Pro Gly Val Thr Tyr Thr Val Tyr Asp Leu
 3540 3545 3550

Val Thr Asp Ala Gly Pro Asp Arg Ile Ala Val Met Met Ser Glu Leu
 3555 3560 3565

Gly Glu Arg Phe Ala Ser Gly Ala Leu Asp Pro Leu Pro Val Arg Ser
 3570 3575 3580

Trp Pro Leu Asp Lys Ala Arg Glu Ala Phe Arg Phe Met Ser Gln Ala
 3585 3590 3595 3600

Lys His Thr Gly Lys Leu Val Leu Asp Val Pro Ala Pro Leu Asp Pro
 3605 3610 3615

Asp Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly Gln Val
 3620 3625 3630

Val Ala Glu His Leu Val Arg Glu Trp Gly Val Arg His Leu Leu Leu
 3635 3640 3645

Ala Ser Arg Arg Gly Leu Asp Ala Pro Gly Ser Gly Glu Leu Ala Asp
 3650 3655 3660

Arg Leu Ser Asp Leu Gly Ala Glu Val Thr Val Ala Ala Asp Val
 3665 3670 3675 3680

Ser Asp Pro Ala Ser Val Val Glu Leu Val Gly Lys Thr Asp Pro Ser
 3685 3690 3695

His Pro Leu Thr Gly Val Val His Ala Ala Gly Val Leu Glu Asp Gly
 3700 3705 3710

Ile Val Thr Ala Gln Thr Pro Glu Gly Leu Ala Arg Val Trp Ala Ala
 3715 3720 3725

Lys Ala Ala Ala Ala Ala Asn Leu His Glu Ala Thr Arg Glu Met Arg
 3730 3735 3740

Leu Gly Leu Phe Val Val Phe Ser Ser Ala Ala Ala Thr Leu Gly Ser
 3745 3750 3755 3760

Pro Gly Gln Ala Asn Tyr Ala Ala Ala Asn Ala Tyr Cys Asp Ala Leu
 3765 3770 3775

Met Gln Arg Arg Arg Ala Ala Gly Gln Val Gly Leu Ser Val Gly Trp
 3780 3785 3790

Gly Leu Trp Glu Ala Pro Asp Ala Lys Pro Gly Val Ala Ala Asp Ala
 3795 3800 3805

Lys Pro Asp Val Ala Ala Asp Ala Lys Thr Gly Val Ala Ala Asp Gly
 3810 3815 3820

Thr Pro Gln Gly Met Thr Gly Thr Leu Ser Gly Thr Asp Val Ala Arg
 3825 3830 3835 3840

Met Ala Arg Ile Gly Val Lys Ala Met Thr Ser Ala His Gly Leu Ala
 3845 3850 3855
 Leu Leu Asp Ala Ala His Arg His Gly Arg Pro His Leu Val Ala Val
 3860 3865 3870
 Asp Leu Asp Thr Arg Val Leu Ala His Lys Pro Ala Pro Ala Leu Pro
 3875 3880 3885
 Ala Leu Leu Arg Ala Phe Ala Gly Asp Gln Gly Gly Gln Gly Gly Gly
 3890 3895 3900
 Arg Gly Gly Gly Arg Gly Gly Gly Pro Ala Arg Pro Ala Ala Ala Thr
 3905 3910 3915 3920
 Thr Arg Gln Asn Val Asp Trp Ala Ala Lys Leu Ser Val Leu Thr Ala
 3925 3930 3935
 Glu Glu Gln His Arg Thr Leu Leu Asp Leu Val Arg Thr His Ala Ala
 3940 3945 3950
 Ala Val Leu Gly His Ala Gly Thr Asp Ala Val Arg Ala Asp Ala Ala
 3955 3960 3965
 Phe Gln Asp Leu Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg Asn
 3970 3975 3980
 Arg Leu Ser Ala Ser Thr Gly Leu Arg Leu Pro Ala Thr Phe Ile Phe
 3985 3990 3995 4000
 Arg His Pro Thr Pro Ser Ala Ile Ala Asp Glu Leu Arg Ala Gln Leu
 4005 4010 4015
 Ala Pro Ala Gly Ala Asp Pro Ala Ala Pro Leu Phe Gly Glu Leu Asp
 4020 4025 4030
 Lys Leu Glu Thr Val Ile Thr Gly His Ala His Asp Glu Ser Thr Arg
 4035 4040 4045
 Thr Arg Leu Ala Ala Arg Leu Gln Asn Leu Leu Trp Arg Leu Asp Asp
 4050 4055 4060
 Thr Ser Ala Arg Ser Asp His Ala Ala Gly Ala Ser Asp Ala Asp Gly
 4065 4070 4075 4080
 Asp Ala Val Glu Asn Arg Asp Leu Glu Ser Ala Ser Asp Asp Glu Leu
 4085 4090 4095
 Phe Glu Leu Ile Asp Arg Glu Leu Pro Ser
 4100 4105

<210> 24
 <211> 1700
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 24
 Met Pro Gly Thr Asn Asp Met Pro Gly Thr Glu Asp Lys Leu Arg His
 1 5 10 15
 Tyr Leu Lys Arg Val Thr Ala Asp Leu Gly Gln Thr Arg Gln Arg Leu
 20 25 30

Arg Asp Val Glu Glu Arg Gln Arg Glu Pro Ile Ala Ile Val Ala Met
 35 40 45
 Ala Cys Arg Tyr Pro Gly Gly Val Ala Ser Pro Glu Gln Leu Trp Asp
 50 55 60
 Leu Val Ala Ser Arg Gly Asp Ala Ile Glu Glu Phe Pro Ala Asp Arg
 65 70 75 80
 Gly Trp Asp Val Ala Gly Leu Tyr His Pro Asp Pro Asp His Pro Gly
 85 90 95
 Thr Thr Tyr Val Arg Glu Ala Gly Phe Leu Arg Asp Ala Ala Arg Phe
 100 105 110
 Asp Ala Asp Phe Phe Gly Ile Asn Pro Arg Glu Ala Leu Ala Ala Asp
 115 120 125
 Pro Gln Gln Arg Val Leu Leu Glu Val Ser Trp Glu Leu Phe Glu Arg
 130 135 140
 Ala Gly Ile Asp Pro Ala Thr Leu Lys Asp Thr Leu Thr Gly Val Tyr
 145 150 155 160
 Ala Gly Val Ser Ser Gln Asp His Met Ser Gly Ser Arg Val Pro Pro
 165 170 175
 Glu Val Glu Gly Tyr Ala Thr Thr Gly Thr Leu Ser Ser Val Ile Ser
 180 185 190
 Gly Arg Ile Ala Tyr Thr Phe Gly Leu Glu Gly Pro Ala Val Thr Leu
 195 200 205
 Asp Thr Ala Cys Ser Ala Ser Leu Val Ala Ile His Leu Ala Cys Gln
 210 215 220
 Ala Leu Arg Gln Gly Asp Cys Gly Leu Ala Val Ala Gly Gly Val Thr
 225 230 235 240
 Val Leu Ser Thr Pro Thr Ala Phe Val Glu Phe Ser Arg Gln Arg Gly
 245 250 255
 Leu Ala Pro Asp Gly Arg Cys Lys Pro Phe Ala Glu Ala Ala Asp Gly
 260 265 270
 Thr Gly Phe Ser Glu Gly Val Gly Leu Ile Leu Leu Glu Arg Leu Ser
 275 280 285
 Asp Ala Arg Arg Asn Gly His Gln Val Leu Gly Val Val Arg Gly Ser
 290 295 300
 Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Asp
 305 310 315 320
 Val Ala Gln Glu Arg Val Ile Arg Gln Ala Leu Thr Asn Ala Arg Val
 325 330 335
 Thr Pro Asp Ala Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr
 340 345 350
 Leu Gly Asp Pro Ile Glu Gly Asn Ala Leu Leu Ala Thr Tyr Gly Lys
 355 360 365
 Asp Arg Pro Ala Asp Arg Pro Leu Trp Leu Gly Ser Val Lys Ser Asn
 370 375 380

Ile	Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile	Lys	Met	
385					390					395					400	
Val	Met	Ala	Met	Arg	His	Gly	Glu	Leu	Pro	Ala	Ser	Leu	His	Ile	Asp	
				405					410					415		
Arg	Pro	Thr	Pro	His	Val	Asp	Trp	Glu	Gly	Gly	Gly	Val	Arg	Leu	Leu	
			420					425						430		
Thr	Asp	Pro	Val	Pro	Trp	Pro	Arg	Ala	Asp	Arg	Pro	Arg	Arg	Ala	Gly	
	435						440					445				
Val	Ser	Ser	Phe	Gly	Ile	Ser	Gly	Thr	Asn	Ala	His	Leu	Ile	Val	Glu	
450						455					460					
Gln	Ala	Pro	Ala	Pro	Pro	Asp	Thr	Ala	Asp	Asp	Ala	Pro	Glu	Gly	Ala	
465					470					475					480	
Ala	Thr	Pro	Gly	Ala	Ser	Asp	Gly	Leu	Val	Val	Pro	Trp	Val	Val	Ser	
				485					490						495	
Ala	Arg	Ser	Pro	Gln	Ala	Leu	Arg	Asp	Gln	Ala	Leu	Arg	Leu	Arg	Asp	
			500					505					510			
Phe	Ala	Gly	Asp	Ala	Ser	Arg	Ala	Pro	Leu	Thr	Asp	Val	Gly	Trp	Ser	
	515						520					525				
Leu	Leu	Arg	Ser	Arg	Ala	Leu	Phe	Glu	Gln	Arg	Ala	Val	Val	Ala	Gly	
530						535					540					
Arg	Glu	Arg	Ala	Glu	Leu	Leu	Ala	Gly	Leu	Ala	Ala	Leu	Ala	Ala	Gly	
545					550					555					560	
Glu	Glu	His	Pro	Ala	Val	Thr	Arg	Ser	Arg	Glu	Glu	Ala	Ala	Val	Ala	
				565					570					575		
Ala	Ser	Gly	Asp	Val	Val	Trp	Leu	Phe	Ser	Gly	Gln	Gly	Ser	Gln	Leu	
			580					585					590			
Val	Gly	Met	Gly	Ala	Gly	Leu	Tyr	Glu	Arg	Phe	Pro	Val	Phe	Ala	Ala	
	595						600					605				
Ala	Phe	Asp	Glu	Val	Cys	Gly	Leu	Leu	Glu	Gly	Glu	Leu	Gly	Val	Gly	
610						615					620					
Ser	Gly	Gly	Leu	Arg	Glu	Val	Val	Phe	Trp	Gly	Pro	Arg	Glu	Arg	Leu	
625					630					635					640	
Asp	His	Thr	Val	Trp	Ala	Gln	Ala	Gly	Leu	Phe	Ala	Leu	Gln	Val	Gly	
				645					650					655		
Leu	Ala	Arg	Leu	Trp	Glu	Ser	Val	Gly	Val	Arg	Pro	Asp	Val	Val	Leu	
			660					665					670			
Gly	His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe	
	675						680					685				
Asp	Leu	Ala	Asp	Ala	Cys	Arg	Val	Val	Gly	Ala	Arg	Ala	Arg	Leu	Met	
690						695					700					
Gly	Gly	Leu	Pro	Glu	Gly	Gly	Ala	Met	Cys	Ala	Val	Gln	Ala	Thr	Pro	
705					710					715					720	
Ala	Glu	Leu	Ala	Ala	Asp	Val	Asp	Gly	Ser	Ser	Val	Ser	Val	Ala	Ala	
				725					730					735		

Val Asn Thr Pro Asp Ser Thr Val Ile Ser Gly Pro Ser Gly Glu Val
740 745 750
Asp Arg Ile Ala Gly Val Trp Arg Glu Arg Gly Arg Lys Thr Lys Ala
755 760 765
Leu Ser Val Ser His Ala Phe His Ser Ala Leu Met Glu Pro Met Leu
770 775 780
Gly Glu Phe Thr Glu Ala Ile Arg Gly Val Lys Phe Arg Gln Pro Ser
785 790 795 800
Ile Pro Leu Met Ser Asn Val Ser Gly Glu Arg Ala Gly Glu Glu Ile
805 810 815
Thr Ser Pro Glu Tyr Trp Ala Arg His Val Arg Gln Thr Val Leu Phe
820 825 830
Gln Pro Gly Val Ala Gln Val Ala Ala Glu Ala Arg Ala Phe Val Glu
835 840 845
Leu Gly Pro Gly Pro Val Leu Thr Ala Ala Ala Gln His Thr Leu Asp
850 855 860
His Ile Thr Glu Pro Glu Gly Pro Glu Pro Val Val Thr Ala Ser Leu
865 870 875 880
His Pro Asp Arg Pro Asp Asp Val Ala Phe Ala His Ala Met Ala Asp
885 890 895
Leu His Val Ala Gly Ile Ser Val Asp Trp Ser Ala Tyr Phe Pro Asp
900 905 910
Asp Pro Ala Pro Arg Thr Val Asp Leu Pro Thr Tyr Ala Phe Gln Gly
915 920 925
Arg Arg Phe Trp Leu Ala Asp Ile Ala Ala Pro Glu Ala Val Ser Ser
930 935 940
Thr Asp Gly Glu Glu Ala Gly Phe Trp Ala Ala Val Glu Gly Ala Asp
945 950 955 960
Phe Gln Ala Leu Cys Asp Thr Leu His Leu Lys Asp Asp Glu His Arg
965 970 975
Ala Ala Leu Glu Thr Val Phe Pro Ala Leu Ser Ala Trp Arg Arg Glu
980 985 990
Arg Arg Glu Arg Ser Ile Val Asp Ala Trp Arg Tyr Arg Val Asp Trp
995 1000 1005
Arg Arg Val Glu Leu Pro Thr Pro Val Pro Gly Ala Gly Thr Gly Pro
1010 1015 1020
Asp Ala Asp Thr Gly Leu Gly Ala Trp Leu Ile Val Ala Pro Thr His
1025 1030 1035 1040
Gly Ser Gly Thr Trp Pro Gln Ala Cys Ala Arg Ala Leu Glu Glu Ala
1045 1050 1055
Gly Ala Pro Val Arg Ile Val Glu Ala Gly Pro His Ala Asp Arg Ala
1060 1065 1070
Asp Met Ala Asp Leu Val Gln Ala Trp Arg Ala Ser Cys Ala Asp Asp
1075 1080 1085

Thr Thr Gln Leu Gly Gly Val Leu Ser Leu Leu Ala Leu Ala Glu Ala
 1090 1095 1100
 Pro Ala Thr Ser Ser Asp Thr Thr Ser His Thr Ser Thr Ser Cys Gly
 1105 1110 1115 1120
 Thr Gly Ser Leu Ala Ser His Gly Leu Thr Gly Thr Leu Thr Leu Leu
 1125 1130 1135
 His Gly Leu Leu Asp Ala Gly Val Glu Ala Pro Leu Trp Cys Ala Thr
 1140 1145 1150
 Arg Gly Ala Val Ser Cys Gly Asp Ala Asp Pro Leu Val Ser Pro Ser
 1155 1160 1165
 Gln Ala Pro Val Trp Gly Leu Gly Arg Val Ala Ala Leu Glu His Pro
 1170 1175 1180
 Glu Leu Trp Gly Gly Leu Val Asp Leu Pro Ala Asp Pro Glu Ser Leu
 1185 1190 1195 1200
 Asp Ala Ser Ala Leu Tyr Ala Val Leu Arg Gly Asp Gly Gly Glu Asp
 1205 1210 1215
 Gln Val Ala Leu Arg Arg Gly Ala Val Leu Gly Arg Arg Leu Val Pro
 1220 1225 1230
 Asp Ala Thr Pro Asp Val Ala Pro Gly Ser Ser Pro Asp Val Ser Gly
 1235 1240 1245
 Gly Ala Ala His Ala Asp Ala Thr Ser Gly Glu Trp Gln Pro His Gly
 1250 1255 1260
 Ala Val Leu Val Thr Gly Gly Val Gly His Leu Ala Asp Gln Val Val
 1265 1270 1275 1280
 Arg Trp Leu Ala Ala Ser Gly Ala Glu His Val Val Leu Leu Asp Thr
 1285 1290 1295
 Gly Pro Ala Asn Ser Arg Gly Pro Gly Arg Asn Asp Asp Leu Ala Ala
 1300 1305 1310
 Glu Ala Ala Glu His Gly Thr Glu Leu Thr Val Leu Arg Ser Leu Ser
 1315 1320 1325
 Glu Leu Thr Asp Val Ser Val Arg Pro Ile Arg Thr Val Ile His Thr
 1330 1335 1340
 Ser Leu Pro Gly Glu Leu Ala Pro Leu Ala Glu Val Thr Pro Asp Ala
 1345 1350 1355 1360
 Leu Gly Ala Ala Val Ser Ala Ala Ala Arg Leu Ser Glu Leu Pro Gly
 1365 1370 1375
 Ile Gly Ser Val Glu Thr Val Leu Phe Phe Ser Ser Val Thr Ala Ser
 1380 1385 1390
 Leu Gly Ser Arg Glu His Gly Ala Tyr Ala Ala Ala Asn Ala Tyr Leu
 1395 1400 1405
 Asp Ala Leu Ala Gln Arg Ala Gly Ala Asp Ala Ala Ser Pro Arg Thr
 1410 1415 1420
 Val Ser Val Gly Trp Gly Ile Trp Asp Leu Pro Asp Asp Gly Asp Val
 1425 1430 1435 1440

Ala Arg Gly Ala Ala Gly Leu Ser Arg Arg Gln Gly Leu Pro Pro Leu
 1445 1450 1455
 Glu Pro Gln Leu Ala Leu Gly Ala Leu Arg Ala Ala Leu Asp Gly Gly
 1460 1465 1470
 Lys Gly His Thr Leu Val Ala Asp Ile Glu Trp Glu Arg Phe Ala Pro
 1475 1480 1485
 Leu Phe Thr Leu Ala Arg Pro Thr Arg Leu Leu Asp Gly Ile Pro Ala
 1490 1495 1500
 Ala Gln Arg Val Leu Asp Ala Ser Ser Glu Ser Ala Glu Ala Ser Glu
 1505 1510 1515 1520
 Asn Ala Ser Ala Leu Arg Arg Glu Leu Thr Ala Leu Pro Val Arg Glu
 1525 1530 1535
 Arg Thr Gly Ala Leu Leu Asp Leu Val Arg Lys Gln Val Ala Ala Val
 1540 1545 1550
 Leu Arg Tyr Glu Pro Gly Gln Asp Val Ala Pro Glu Lys Ala Phe Lys
 1555 1560 1565
 Asp Leu Gly Phe Asp Ser Leu Val Val Val Glu Leu Arg Asn Arg Leu
 1570 1575 1580
 Arg Ala Ala Thr Gly Leu Arg Leu Pro Ala Thr Leu Val Tyr Asp Tyr
 1585 1590 1595 1600
 Pro Thr Pro Arg Thr Leu Ala Ala His Leu Leu Asp Arg Val Leu Pro
 1605 1610 1615
 Asp Gly Gly Ala Ala Glu Leu Pro Val Ala Ala His Leu Asp Asp Leu
 1620 1625 1630
 Glu Ala Ala Leu Thr Asp Leu Pro Ala Asp Asp Pro Arg Arg Lys Gly
 1635 1640 1645
 Leu Val Arg Arg Leu Gln Thr Leu Leu Trp Lys Gln Pro Asp Ala Met
 1650 1655 1660
 Gly Ala Ala Gly Pro Ala Asp Glu Glu Glu Gln Ala Ala Pro Glu Asp
 1665 1670 1675 1680
 Leu Ser Thr Ala Ser Ala Asp Asp Met Phe Ala Leu Ile Asp Arg Glu
 1685 1690 1695
 Trp Gly Thr Arg
 1700

<210> 25
 <211> 980
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 25
 Val Ser Gly Val Glu Arg Gly Val Gly Ser Ala Gly Pro Val Glu Gln
 1 5 10 15
 Gly Asp Gly Leu Ala Gly Leu Val Glu Arg Ala Glu Ala Leu Ala Ala
 20 25 30

Leu	Arg	Gly 35	Ala	Phe	Asp	Gly	Ser 40	Pro	Gly	Thr	Gly	Gly 45	Ser	Leu	Val
Val	Leu 50	Ser	Gly	Ala	Val	Gly 55	Thr	Gly	Lys	Thr	Ala 60	Leu	Leu	Arg	Ala
Trp 65	Ala	Asp	Arg	Ile	Gly 70	Ala	Asp	Ala	Asp	Ala 75	Leu	Val	Leu	Thr	Ala 80
Thr	Ala	Cys	Arg	Ala 85	Glu	Arg	Asp	Leu	Pro 90	Leu	Gly	Val	Leu	Glu 95	Gln
Leu	Val	Arg	Ser 100	Pro	Gly	Leu	Pro	Pro 105	Ala	Ser	Ala	Glu	Arg 110	Ala	Leu
Ala	Trp	Trp 115	Asp	Glu	Glu	Ala	Ser 120	Ala	Thr	Pro	Gly	Lys 125	Thr	Asp	Ala
Asn	Gly 130	Thr	Ser	Ala	Asn	Gly 135	Thr	Asp	Ala	Asn	Gly 140	Thr	Gly	Ala	Gly
Gln 145	Thr	Gly	Ala	Gly	Gln 150	Ala	Gly	Val	Gly	Gln 155	Thr	Gly	Val	Gly	Gly 160
Glu	Pro	Val	Leu	Ala 165	Ala	Ser	Ala	Leu	Arg 170	Gly	Leu	Cys	Glu	Val 175	Leu
Arg	Asp	Leu 180	Leu	Ala	Glu	Arg	Pro 185	Val	Val	Val	Ala	Val	Asp 190	Asp	Ala
His	His	Ala 195	Asp	Ala	Ala	Ser	Leu 200	Gln	Cys	Leu	Leu	Ser 205	Val	Val	Arg
Arg	Leu 210	Arg	Ser	Ala	Arg	Leu 215	His	Val	Leu	Phe	Thr 220	Glu	Tyr	Ala	His
Gln 225	Lys	Ala	Gln	Asn	Ala 230	Leu	Leu	Ser	Ser	Glu 235	Phe	Leu	His	Glu	Pro 240
Ala	Leu	Arg	Arg	Ile 245	Arg	Leu	Glu	Pro	Leu 250	Ser	Lys	Ala	Gly	Val 255	Glu
Ala	Leu	Leu	Ala 260	Arg	His	Leu	Asp	Glu 265	Arg	Thr	Ala	Gln	Asp 270	Leu	Thr
Pro	Val 275	Val	His	Gly	Met	Ser	Ala 280	Gly	His	Pro	Leu	Leu 285	Val	Arg	Ala
Leu	Ala 290	Glu	Asp	His	Arg	Ala 295	Ala	Gly	Gly	Ala	Gly 300	Glu	Ala	Tyr	Gly
Arg 305	Ala	Val	Leu	Ser	Phe 310	Leu	Tyr	Arg	His	Glu 315	Thr	Pro	Val	Thr	Gln 320
Val	Ala	Arg	Ala	Ile 325	Ala	Ala	Leu	Gly	Ala 330	His	Ala	Gly	Pro	Gly 335	Gln
Val	Gly	Arg	Leu 340	Leu	Asp	Val	Asp	Ala 345	Ala	Ser	Val	Glu	Arg 350	Ala	Val
Arg	Gln	Leu 355	Thr	Val	Ala	Glu	Val 360	Leu	His	Glu	Gly	Arg 365	Leu	Cys	His
Pro	Ala 370	Phe	Ala	Ala	Ala	Val 375	Leu	Asp	Gly	Met	Pro 380	Pro	Glu	Glu	Arg

Arg Ala Leu His Gly Arg Val Ala Asp Leu Leu His Glu Glu Gly Ala
 385 390 395 400
 Pro Ala Thr Glu Val Ala Ala His Leu Val Ala Ala Asp Arg Ser Asp
 405 410 415
 Ala Pro Trp Ala Val Pro Val Phe Gln Glu Ala Ala Gln Leu Ala Leu
 420 425 430
 Asp Glu Asp Gln Val Glu Thr Gly Val Asp Tyr Leu Arg Ala Ala His
 435 440 445
 Gln Arg Cys Arg Gly Ala Ala Gln Arg Ala Ala Val Val Gly Ala Leu
 450 455 460
 Ala Asp Ala Glu Trp Arg Leu Asp Pro Ala Lys Val Leu Arg His Leu
 465 470 475 480
 Pro Asp Pro Ala Ala Met Ala Pro Gln Thr Asp Pro Ala Ala Leu Ala
 485 490 495
 Pro His Thr Asp Pro Ala Pro Thr Ala Ala Pro Thr Ala Ala Pro Thr
 500 505 510
 Pro Thr Pro Ile Pro Thr Thr Pro Pro Leu Pro Thr His Leu Leu Trp
 515 520 525
 His Gly Arg Val Glu Glu Gly Leu Asp Ala Ile Gly Thr Leu Thr Gly
 530 535 540
 Pro Gly Pro Asn Pro Ala Gly Ala Pro Pro Met Asn Pro Ala Asp Leu
 545 550 555 560
 Asp Thr Pro Trp Leu Trp Gly Ala Tyr Leu Tyr Pro Gly His Val Lys
 565 570 575
 Glu Arg Leu Gly Ser Gly Ala Leu Ser Pro Gln Arg Ser Thr Pro Pro
 580 585 590
 Ala Val Thr Pro Glu Leu Gln Gly Ala Gly Thr Leu Met Asn Asp Leu
 595 600 605
 Leu His Gly Gly Glu Arg Asp Ala Thr Glu Ala Ala Glu Arg Ala Leu
 610 615 620
 Asn Arg Tyr Arg Leu Gly Pro Arg Thr Ile Ala Val Gln Thr Ala Ala
 625 630 635 640
 Leu Ala Ala Leu Thr Tyr Arg Asp Arg Pro His Arg Ala Ala Ala Trp
 645 650 655
 Cys Asp Gly Leu Val Ala Gln Ala Asp Glu Arg Asn Ser Pro Thr Trp
 660 665 670
 Arg Ala Leu Phe Thr Ala Trp Arg Ala Leu Leu His Leu Arg Gln Gly
 675 680 685
 Asp Pro Ala Ala Ala Glu Gln Arg Ala Glu Thr Ala Leu Ala Leu Leu
 690 695 700
 Gly Ser Lys Gly Trp Gly Ala Ala Ile Gly Leu Pro Leu Ala Ala Ala
 705 710 715 720
 Val Gln Ala Lys Ala Ala Leu Gly Asp Val Asp Gly Ala Ala Ala Leu
 725 730 735

Leu Glu Arg Pro Val Pro Gln Ala Val Phe Gln Thr Arg Thr Gly Leu
 740 745 750
 His Tyr Leu Ala Ala Arg Gly Arg Tyr His Leu Ala Thr Gly Cys His
 755 760 765
 Tyr Ala Ala Leu Cys Asp Phe Tyr Ala Cys Gly Thr Arg Met Ser Ser
 770 775 780
 Trp Gly Val Asp Leu Pro Ala Leu Glu Pro Trp Arg Leu Gly Ala Ala
 785 790 795 800
 Glu Ala Tyr Leu Ala Leu Gly Glu Gly Leu Leu Ala Arg Gln Leu Val
 805 810 815
 Asp Gly Gln Leu Pro Leu Pro Thr Pro Asp Asp Gly Arg Thr Trp Gly
 820 825 830
 Met Thr Leu Arg Leu Arg Ala Ala Thr Ser Pro Ala Pro Ala Arg Ala
 835 840 845
 Glu Leu Leu Asp Glu Ala Val Ala Val Leu Arg Glu Ser Gly Asp Thr
 850 855 860
 Phe Glu Leu Ala Arg Ala Val Ala Asp Gln Ala Val Ala Val Arg Glu
 865 870 875 880
 Gly Gly Glu Ala Glu Arg Ala Arg Leu Leu Ala Arg Lys Ala Glu Leu
 885 890 895
 Leu Ala Arg Arg Trp Gly Ser Ala Pro Ala Pro Ala Thr Val Pro Glu
 900 905 910
 Pro Pro Glu Arg Pro Gly Pro Ala Thr Pro Asp Ala Glu Leu Thr Ser
 915 920 925
 Ala Glu Arg Arg Val Ala Glu Leu Ala Ala Glu Gly Phe Thr Asn Arg
 930 935 940
 Glu Ile Ser Arg Lys Leu Cys Val Thr Val Ser Thr Val Glu Gln His
 945 950 955 960
 Leu Thr Arg Ile Tyr Arg Lys Leu Asp Val Arg Arg Leu Asp Leu Gln
 965 970 975
 Ala Ala Leu Gly
 980

<210> 26
 <211> 496
 <212> PRT
 <213> *Streptomyces cinnamonensis*

<400> 26
 Val Thr Thr Thr Arg Pro Ala His Ala Val Val Leu Gly Ala Ser Met
 1 5 10 15
 Ala Gly Thr Leu Ala Ala His Val Leu Ala Arg His Val Asp Ala Val
 20 25 30
 Thr Val Val Glu Arg Asp Ala Leu Pro Glu Glu Pro Gln His Arg Lys
 35 40 45

Gly Val Pro Gln Ala Arg His Ala His Leu Leu Trp Ser Asn Gly Ala
 50 55 60
 Arg Leu Ile Glu Glu Met Leu Pro Gly Thr Thr Asp Arg Leu Leu Ala
 65 70 75 80
 Ala Gly Ala Arg Arg Leu Gly Phe Pro Glu Asp Leu Val Thr Leu Thr
 85 90 95
 Gly Gln Gly Trp Gln His Arg Phe Pro Ala Thr Gln Phe Ala Leu Val
 100 105 110
 Ala Ser Arg Pro Leu Leu Asp Leu Thr Val Arg Gln Gln Ala Leu Gly
 115 120 125
 Ala Asp Asn Ile Thr Val Arg Gln Arg Thr Glu Ala Val Glu Leu Thr
 130 135 140
 Gly Ser Gly Gly Gly Ser Gly Gly Arg Val Thr Gly Val Val Val Arg
 145 150 155 160
 Asp Leu Asp Ser Gly Arg Gln Glu Gln Leu Glu Ala Asp Leu Val Ile
 165 170 175
 Asp Ala Thr Gly Arg Gly Ser Arg Leu Lys Gln Trp Leu Ala Ala Leu
 180 185 190
 Gly Val Pro Ala Leu Glu Glu Asp Val Val Asp Ala Gly Val Ala Tyr
 195 200 205
 Ala Thr Arg Leu Phe Lys Ala Pro Pro Gly Ala Thr Thr His Phe Pro
 210 215 220
 Ala Val Asn Ile Ala Ala Asp Asp Arg Val Arg Glu Pro Gly Arg Phe
 225 230 235 240
 Gly Val Val Tyr Pro Ile Glu Gly Gly Arg Trp Leu Ala Thr Leu Ser
 245 250 255
 Cys Thr Arg Gly Ala Gln Leu Pro Thr His Glu Asp Glu Phe Ile Pro
 260 265 270
 Phe Ala Glu Asn Leu Asn His Pro Ile Leu Ala Asp Leu Leu Arg Asp
 275 280 285
 Ala Glu Pro Leu Thr Pro Val Phe Gly Ser Arg Ser Gly Ala Asn Arg
 290 295 300
 Arg Leu Tyr Pro Glu Arg Leu Glu Gln Trp Pro Asp Gly Leu Leu Val
 305 310 315 320
 Ile Gly Asp Ser Leu Thr Ala Phe Asn Pro Ile Tyr Gly His Gly Met
 325 330 335
 Ser Ser Ala Ala Arg Cys Ala Thr Thr Ile Asp Arg Glu Phe Glu Arg
 340 345 350
 Ser Val Gln Glu Gly Thr Gly Ser Ala Arg Ala Gly Thr Arg Ala Leu
 355 360 365
 Gln Lys Ala Ile Gly Ala Ala Val Asp Asp Pro Trp Ile Leu Ala Ala
 370 375 380
 Thr Lys Asp Ile Asp Tyr Val Asn Cys Arg Val Ser Ala Thr Asp Pro
 385 390 395 400

Arg Leu Ile Gly Val Asp Thr Glu Gln Arg Leu Arg Phe Ala Glu Ala
 405 410 415
 Ile Thr Ala Ala Ser Ile Arg Ser Pro Lys Ala Ser Glu Ile Val Thr
 420 425 430
 Asp Val Met Ser Leu Asn Ala Pro Gln Ala Glu Leu Gly Ser Asn Arg
 435 440 445
 Phe Leu Met Ala Met Arg Ala Asp Glu Arg Leu Pro Glu Leu Thr Ala
 450 455 460
 Pro Pro Phe Leu Pro Glu Glu Leu Ala Val Val Gly Leu Asp Ala Ala
 465 470 475 480
 Thr Ile Ser Pro Thr Pro Thr Pro Thr Pro Thr Ala Ala Val Arg Ser
 485 490 495

<210> 27
 <211> 140
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 27
 Met Pro Asp Glu Ala Ala Arg Lys Gln Met Ala Val Asp Tyr Ala Glu
 1 5 10 15
 Arg Ile Asn Ala Gly Asp Ile Glu Gly Val Leu Asp Leu Phe Thr Asp
 20 25 30
 Asp Ile Val Phe Glu Asp Pro Val Gly Arg Pro Pro Met Val Gly Lys
 35 40 45
 Asp Asp Leu Arg Arg His Leu Glu Leu Ala Val Ser Cys Gly Thr His
 50 55 60
 Glu Val Pro Asp Pro Pro Met Thr Ser Met Asp Asp Arg Phe Val Val
 65 70 75 80
 Thr Pro Thr Thr Val Thr Val Gln Arg Pro Arg Pro Met Thr Phe Arg
 85 90 95
 Ile Val Gly Ile Val Glu Leu Asp Glu His Gly Leu Gly Arg Arg Val
 100 105 110
 Gln Ala Phe Trp Gly Val Thr Asp Val Thr Met Asp Asp Pro Ala Gly
 115 120 125
 Pro Ala Asp Thr Thr His Pro Glu Gly Ile Arg Ala
 130 135 140

<210> 28
 <211> 144
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 28
 Met Asn Glu Phe Ala Arg Lys Lys Arg Ala Leu Glu His Ser Arg Arg
 1 5 10 15
 Ile Asn Ala Gly Asp Leu Asp Ala Ile Ile Asp Leu Tyr Ala Pro Asp
 20 25 30

Ala Val Leu Glu Asp Pro Val Gly Leu Pro Pro Val Thr Gly His Asp
35 40 45

Ala Leu Arg Ala His Tyr Glu Pro Leu Leu Ala Ala His Leu Arg Glu
50 55 60

Glu Ala Ala Glu Pro Val Ala Gly Gln Asp Ala Thr His Ala Leu Ile
65 70 75 80

Gln Ile Ser Ser Val Met Asp Tyr Leu Pro Val Gly Pro Leu Tyr Ala
85 90 95

Glu Arg Gly Trp Leu Lys Ala Pro Asp Ala Pro Gly Thr Ala Arg Ile
100 105 110

His Arg Thr Ala Met Leu Val Ile Arg Met Asp Ala Ser Gly Leu Ile
115 120 125

Arg His Leu Lys Ser Tyr Trp Gly Thr Ser Asp Leu Thr Val Leu Gly
130 135 140

<210> 29
<211> 3753
<212> PRT
<213> *Streptomyces cinnamonensis*

<400> 29
Met Ser Asn Glu Glu Lys Leu Leu Asp His Leu Lys Trp Val Thr Ala
1 5 10 15

Glu Leu Arg Gln Ala Arg Gln Arg Leu His Asp Lys Glu Ser Thr Glu
20 25 30

Pro Val Ala Ile Val Gly Met Ala Cys Arg Tyr Pro Gly Gly Ala Arg
35 40 45

Ser Ala Glu Asp Leu Trp Glu Leu Val Arg Asp Gly Gly Asp Ala Val
50 55 60

Ala Gly Phe Pro Asp Asp Arg Gly Trp Asp Leu Glu Ser Leu Tyr His
65 70 75 80

Pro Asp Pro Glu His Pro Ala Thr Ser Tyr Val Arg Asp Gly Ala Phe
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Leu Tyr Asp Ala Gly His Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro
100 105 110

Arg Glu Ala Thr Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr
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Ala Trp Glu Ala Ile Glu His Ala Gly Met Asn Pro His Ala Leu Lys
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Gly Ser Asp Thr Gly Val Phe Thr Gly Val Ser Ala His Asp Tyr Leu
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Thr Leu Ile Ser Gln Thr Ala Ser Asp Val Glu Gly Tyr Ile Gly Thr
165 170 175

Gly Asn Leu Gly Ser Val Val Ser Gly Arg Ile Ser Tyr Thr Val Gly
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Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu
 195 200 205
 Val Ala Ile His Leu Ala Ser Gln Ala Leu Arg Gln Gly Glu Cys Ser
 210 215 220
 Leu Ala Leu Ala Gly Gly Ser Thr Val Met Ala Thr Pro Gly Ser Phe
 225 230 235 240
 Thr Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys
 245 250 255
 Pro Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly Ala Gly
 260 265 270
 Val Val Ala Leu Glu Leu Leu Ser Glu Ala Arg Arg Arg Gly His Lys
 275 280 285
 Val Leu Ala Val Ile Arg Gly Ser Ala Thr Asn Gln Asp Gly Thr Ser
 290 295 300
 Asn Gly Leu Ala Ala Pro Asn Gly Pro Ser Gln Glu Arg Val Ile Arg
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 Ala Ala Leu Ala Asn Ala Arg Leu Ser Ala Glu Asp Ile Asp Ala Val
 325 330 335
 Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala Gln
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 Ala Leu Ile Ala Thr Tyr Gly Gln Gly Arg Pro Glu Asp Arg Pro Leu
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 Trp Leu Gly Ser Val Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala
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 Gly Val Ala Gly Val Ile Lys Met Val Met Ala Met Arg Asn Gly Leu
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 Leu Pro Thr Ser Leu His Ile Asp Ala Pro Ser Pro His Val Gln Trp
 405 410 415
 Glu Gln Gly Ser Val Arg Leu Leu Ser Glu Pro Val Asp Trp Pro Ala
 420 425 430
 Glu Arg Thr Arg Arg Ala Gly Ile Ser Ala Phe Gly Ile Ser Gly Thr
 435 440 445
 Asn Ala His Leu Ile Leu Glu Glu Ala Pro Pro Glu Glu Asp Ala Pro
 450 455 460
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 Gly Arg Thr Pro Asp Ala Leu Arg Glu Gln Ala Arg Arg Leu Gly Glu
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Glu Ala Ser Ala Asp Val Val Ala Gly Val Ala Gly Asp Val Gly Pro
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 Gly Pro Val Leu Val Phe Pro Gly Gln Gly Ser Gln Trp Val Gly Met
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 Gly Ala Gln Leu Leu Asp Glu Ser Pro Val Phe Ala Ala Arg Ile Ala
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 Glu Cys Glu Gln Ala Leu Ser Ala His Val Asp Trp Ser Leu Ser Asp
 595 600 605
 Val Leu Arg Gly Asp Gly Ser Glu Leu Ser Arg Val Glu Val Val Gln
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 Pro Val Leu Trp Ala Val Met Val Ser Leu Ala Ala Val Trp Ala Asp
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 Tyr Gly Ile Thr Pro Ala Ala Val Ile Gly His Ser Gln Gly Glu Met
 645 650 655
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 Ile Val Ala Val Arg Ser Asp Ala Leu Arg Gln Leu Gln Gly His Gly
 675 680 685
 Asp Met Ala Ser Leu Ser Thr Gly Ala Glu Gln Ala Ala Glu Leu Ile
 690 695 700
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 705 710 715 720
 Thr Val Ile Ser Gly Pro Pro Glu His Val Ala Ala Val Val Ala Asp
 725 730 735
 Ala Glu Ala Gln Gly Leu Arg Ala Arg Val Ile Asp Val Arg Tyr Ala
 740 745 750
 Ser His Gly Pro Gln Ile Asp Gln Leu His Asp Leu Leu Thr Asp Arg
 755 760 765
 Leu Ala Asp Ile Gln Pro Thr Thr Thr Asp Val Ala Phe Tyr Ser Thr
 770 775 780
 Val Thr Ala Glu Arg Leu Asp Asp Thr Thr Ala Leu Asp Thr Ala Tyr
 785 790 795 800
 Trp Val Thr Asn Leu Arg Gln Pro Val Arg Phe Ala Asp Thr Ile Glu
 805 810 815
 Ala Leu Leu Ala Asp Gly Tyr Arg Leu Phe Ile Glu Ala Ser Pro His
 820 825 830
 Pro Val Leu Asn Leu Gly Ile Gln Glu Thr Ile Glu Gln Gln Ala Gly
 835 840 845
 Ala Ala Gly Thr Ala Val Thr Ile Pro Thr Leu Arg Arg Asp His Gly
 850 855 860
 Asp Thr Thr Gln Leu Thr Arg Ala Ala Ala His Ala Phe Thr Ala Gly
 865 870 875 880
 Ala Pro Val Asp Trp Arg Arg Trp Phe Pro Ala Asp Pro Thr Pro Arg
 885 890 895

Thr Val Asp Leu Pro Thr Tyr Ala Phe Gln His Lys His Tyr Trp Val
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 Glu Pro Pro Ala Ala Val Ala Ala Val Gly Gly Gly His Asp Pro Val
 915 920 925
 Glu Ala Arg Val Trp Gln Ala Ile Glu Asp Leu Asp Ile Asp Ala Leu
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 Ala Gly Ser Leu Glu Ile Glu Gly Gln Ala Glu Ser Val Gly Ala Leu
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 Glu Ser Ala Leu Pro Val Leu Ser Ala Trp Arg Arg Arg His Arg Glu
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 Gln Ser Thr Val Asp Ser Trp Arg Tyr Gln Val Thr Trp Lys His Leu
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 1060 1065 1070
 Pro His Pro Glu His Ser Ala Val Pro Ala Gly Leu Ala Ala Thr Thr
 1075 1080 1085
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 1090 1095 1100
 Thr Leu Thr Gln Gly Ala Val Ser Thr Ser Ala Gly Asp Ala Leu Thr
 1105 1110 1115 1120
 His Pro Val Gln Ala Gln Val Trp Gly Leu Gly Arg Val Ala Ala Leu
 1125 1130 1135
 Glu Tyr Pro Arg Leu Trp Gly Gly Leu Val Asp Leu Pro Ala Arg Ile
 1140 1145 1150
 Asp His Gln Thr Leu Ala Arg Leu Ala Ala Ala Leu Val Pro Gln Asp
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 Glu Asp Gln Ile Ser Ile Arg Pro Ser Gly Val His Ala Arg Arg Leu
 1170 1175 1180
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 1185 1190 1195 1200
 Asp Gly Thr Thr Leu Ile Thr Gly Gly Thr Gly Gly Ile Gly Ala Val
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 Leu Ala Arg Trp Leu Ala Arg Ala Gly Ala Pro His Leu Leu Leu Thr
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 Ser Arg Arg Gly Pro Asp Ala Pro Gly Ala Gln Glu Leu Ala Ala Glu
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Leu Thr Glu Leu Gly Ala Ala Val Thr Val Thr Ala Cys Asp Val Gly
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 Asp Arg Glu Gln Val Arg Arg Leu Ile Asp Asp Val Pro Ala Glu His
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 Pro Leu Thr Ala Val Ile His Ala Ala Gly Val Pro Asn Tyr Ile Gly
 1285 1290 1295
 Leu Gly Asp Val Ser Gly Ala Glu Leu Asp Glu Val Leu Arg Pro Lys
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 Ala Leu Ala Ala His His Leu His Glu Leu Thr Arg Glu Leu Pro Leu
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 Ser Ala Phe Val Met Phe Ser Ser Gly Ala Gly Val Trp Gly Ser Gly
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 Gln Gln Gly Ala Tyr Gly Ala Ala Asn His Phe Leu Asp Ala Leu Ala
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 Glu His Arg Arg Ala Glu Gly Leu Pro Ala Thr Ser Ile Ala Trp Gly
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 Pro Trp Ala Glu Ala Gly Met Ala Ala Asp Gln Ala Ala Leu Thr Phe
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 Leu Thr Glu Ala Lys Pro Ala Gln Gln Arg Gln Leu Leu Leu Gln His
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 1490 1495 1500
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Glu Glu Leu Trp Asp Leu Val Ala Ala Gly Lys Asp Ala Met Gly Ala
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 Pro Glu Ser Arg Gly Thr Ser Tyr Val Arg Glu Gly Gly Phe Leu Tyr
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 1860 1865 1870
 Leu Ala Asn Ala Arg Leu Ser Ala Glu Asp Val Asp Ala Val Glu Ala
 1875 1880 1885
 His Gly Thr Gly Thr Met Leu Gly Asp Pro Ile Glu Ala Ser Ala Leu
 1890 1895 1900
 Val Ala Thr Tyr Gly Lys Glu Arg Pro Ala Asp Arg Pro Leu Trp Leu
 1905 1910 1915 1920
 Gly Ser Ile Lys Ser Asn Ile Gly His Ala Gln Ala Ser Ala Gly Val
 1925 1930 1935
 Ala Gly Val Ile Lys Met Val Met Ala Leu Arg Asn Glu Gln Leu Pro
 1940 1945 1950

Ala Ser Leu His Ile Asp Ala Pro Thr Pro His Val Asp Trp Asp Gly
 1955 1960 1965
 Ser Gly Val Arg Leu Leu Ser Glu Pro Val Ser Trp Pro Arg Gly Glu
 1970 1975 1980
 Arg Pro Arg Arg Ala Gly Val Ser Ala Phe Gly Ile Ser Gly Thr Asn
 1985 1990 1995 2000
 Ala His Leu Ile Leu Glu Gln Ala Pro Asp Ala Pro Glu Pro Val Thr
 2005 2010 2015
 Ala Pro Ala Glu Asp Ala Ala Ala Pro Ala Gly Val Val Pro Trp Val
 2020 2025 2030
 Val Ser Ala Arg Gly Glu Glu Ala Leu Arg Ala Gln Ala Arg Leu Leu
 2035 2040 2045
 Ala Asp Arg Ala Thr Ala Asp Pro Arg Leu Ala Ser Pro Leu Asp Val
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Asp Thr Ile Glu Ala Leu Leu Ala Asp Gly Tyr Arg Leu Phe Ile Glu
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Gly Asp Ala Ala Gln Leu Thr Arg Ala Ala Ala Gln Ala Phe Gly Ala
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Gly Gly Ser His Leu Leu Thr Gly Arg Ile Ser Pro Arg Asp Gln Ala
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His Cys Ala Gly Thr Val Asn Asp Ala Val Val Gln Asn Leu Thr Ala
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 Asp His Pro Asn Pro Ala Glu Leu Ala Ala Gln Leu Arg Gln Glu Leu
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Leu Gly Arg Asp Gly Ala Ser Gly Gln Gly Asn Gly Gln Pro Thr Gly
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His Gly Gln Ala Val Glu Gly Gln Arg
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<211> 1641

<212> PRT

<213> Streptomyces cinnamomensis

<400> 30

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20 25 30

Gly His Glu Pro Val Ala Val Ile Gly Met Ala Cys Arg Leu Pro Gly
35 40 45

Gly Val Arg Ser Pro Glu Glu Phe Trp Glu Leu Val Ser Thr Gly Gly
50 55 60

Asp Ala Val Ala Pro Leu Pro Gly Asn Arg Asn Trp Asp Leu Asp Ser
65 70 75 80

Leu Tyr Asp Pro Asp Pro Glu Ser Thr Gly Thr Ser Tyr Val Arg Glu
85 90 95

Gly Gly Phe Val Tyr Asp Ala Gly Asp Phe Asp Pro Thr Phe Phe Gly
100 105 110

Ile Gly Pro Thr Glu Ala Ala Ala Met Ala Pro Gln Gln Arg Leu Ala
115 120 125 .

Leu Glu Thr Ala Trp Glu Ala Ile Glu Arg Ala Gly Ile Asp Pro Leu
130 135 140

Ser Leu Arg Ser Ser Asp Thr Ser Thr Phe Ile Gly Cys Asp Gly Leu
145 150 155 160

Asp Tyr Ala Leu Gly Ala Ser Glu Val Pro Glu Gly Thr Ala Gly Tyr
165 170 175

Phe Thr Ile Gly Asn Ser Gly Ser Val Thr Ser Gly Arg Val Ala Tyr
180 185 190

Thr Leu Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser
195 200 205

Ser Ser Leu Val Ser Leu His Leu Ala Thr Gln Ala Leu Arg Thr Gln
210 215 220

Glu Cys Ser Leu Ala Leu Ala Gly Gly Thr Tyr Val Met Ser Ser Pro
225 230 235 240

Ala Pro Leu Ile Gly Phe Ser Glu Leu Arg Gly Leu Ala Pro Asp Gly
245 250 255

Arg Cys Lys Pro Phe Ser Ala Ser Ser Asp Gly Met Gly Met Ala Glu
 260 265 270
 Gly Thr Gly Val Val Leu Leu Glu Arg Leu Ser Asp Ala Arg Arg Lys
 275 280 285
 Gly His Lys Val Leu Ala Val Ile Arg Gly Ser Ala Ile Asn Gln Asp
 290 295 300
 Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala Gln Glu Arg
 305 310 315 320
 Val Ile Arg Ala Ala Leu Ala Asn Ala Arg Leu Ala Pro Glu Asp Ile
 325 330 335
 Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile
 340 345 350
 Glu Ala Gly Ala Leu Ile Ser Ala Tyr Gly Arg Glu Arg Pro Glu Asp
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 Arg Pro Leu Trp Val Gly Ala Val Lys Ser Asn Ile Gly His Thr Gln
 370 375 380
 Ile Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Leu Arg
 385 390 395 400
 His Asp Leu Leu Pro Ala Ile Leu His Val Asp Ala Pro Ser Pro His
 405 410 415
 Val Glu Trp Asp Gly Ser Gly Leu Arg Leu Leu Thr Asp Pro Val Lys
 420 425 430
 Trp Pro Arg Gly Glu Arg Pro Arg Arg Ala Gly Val Ser Ser Phe Gly
 435 440 445
 Phe Ser Gly Thr Asn Ala His Leu Ile Leu Glu Glu Ala Pro Pro Glu
 450 455 460
 Glu Glu Asp Val Pro Gly Ser Val Ala Glu Glu Pro Gly Gly Val Val
 465 470 475 480
 Pro Trp Val Val Ser Gly Arg Thr Pro Asp Ala Leu Arg Ala Gln Ala
 485 490 495
 Arg Arg Leu Gly Glu Phe Ala Ala Gly Pro Ala Asp Ala Ser Ala Ala
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 Asp Val Gly Trp Ser Leu Thr Thr Thr Arg Ser Val Phe Glu His Arg
 515 520 525
 Ala Val Val Val Gly Arg Asp Arg Asp Ala Leu Thr Ala Gly Leu Gly
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 Gly Asp Val Gly Pro Gly Pro Val Leu Val Phe Pro Gly Gln Gly Ser
 565 570 575
 Gln Trp Val Gly Met Gly Ala Gln Leu Leu Asp Glu Ser Pro Val Phe
 580 585 590
 Ala Ala Arg Ile Ala Glu Cys Glu Arg Ala Leu Ser Ala Tyr Val Asp
 595 600 605

Trp Ser Leu Ser Ala Val Leu Arg Gly Asp Gly Ser Glu Leu Ser Arg
 610 615 620
 Val Glu Val Val Gln Pro Val Leu Trp Ala Val Met Val Ser Leu Ala
 625 630 635 640
 Ala Val Trp Ala Asp Tyr Gly Val Thr Pro Ala Ala Val Ile Gly His
 645 650 655
 Ser Gln Gly Glu Met Ala Ala Ala Cys Val Ala Gly Ala Leu Ser Leu
 660 665 670
 Glu Asp Ala Ala Arg Ile Val Ala Val Arg Ser Asp Ala Leu Arg Arg
 675 680 685
 Leu Gln Gly His Gly Asp Met Ala Ser Leu Ser Thr Gly Ala Glu Gln
 690 695 700
 Ala Ala Glu Leu Ile Gly Asp Arg Pro Gly Val Val Val Ala Ala Val
 705 710 715 720
 Asn Gly Pro Ser Ser Thr Val Ile Ser Gly Pro Pro Glu His Val Ala
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 Ala Val Val Ala Asp Ala Glu Ala Arg Gly Leu Arg Ala Arg Val Ile
 740 745 750
 Asp Val Gly Tyr Ala Ser His Gly Pro Gln Ile Asp Gln Leu His Asp
 755 760 765
 Leu Leu Thr Glu Arg Leu Ala Asp Ile Arg Pro Ala Asn Thr Asp Val
 770 775 780
 Ala Phe Tyr Ser Thr Val Thr Ala Glu Arg Leu Thr Asp Thr Thr Ala
 785 790 795 800
 Leu Asp Thr Asp Tyr Trp Val Thr Asn Leu Arg Gln Pro Val Arg Phe
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 Ala Asp Thr Ile Glu Ala Leu Leu Ala Asp Gly Tyr Arg Leu Phe Ile
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 Glu Ala Ser Ala His Pro Val Leu Gly Leu Gly Met Glu Glu Thr Ile
 835 840 845
 Glu Gln Ala Asp Ile Pro Ala Thr Val Val Pro Thr Leu Arg Arg Asp
 850 855 860
 His Gly Asp Thr Thr Gln Leu Thr Arg Ala Ala Ala His Ala Phe Thr
 865 870 875 880
 Ala Gly Ala Pro Val Asp Trp Arg Arg Trp Phe Pro Ala Asp Pro Thr
 885 890 895
 Pro Arg Thr Val Asp Leu Pro Thr Tyr Ala Phe Gln His Gln His Tyr
 900 905 910
 Trp Leu Glu Arg Ser Ala Ser Ala Ser Gly Ala Val Ser Gly Glu Gln
 915 920 925
 Ser Ala Ala Glu Ala Gln Leu Trp His Ala Val Glu Glu Leu Asp Leu
 930 935 940
 Gly Leu Leu Ala Glu Thr Leu Gly Ser Glu Glu Gly Ser Glu Glu Ala
 945 950 955 960

Val Arg Ala Leu Glu Pro Ala Leu Pro Val Leu Lys Gly Trp Arg Arg
965 970 975
Arg His Gln Asp Gln Ala Thr Ile Asp Ser Trp Arg Tyr Arg Val Thr
980 985 990
Trp Lys Gln Arg Ser Asp Gly Pro Ala Pro Glu Leu Gly Gly Asp Trp
995 1000 1005
Leu Leu Phe Val Pro Ala Asp Lys Ala Glu His Pro Ala Val Arg Ala
1010 1015 1020
Thr Ala Glu Ala Leu Ser Glu His Gly Ala Ala Ala Val Arg Leu His
1025 1030 1035 1040
Pro Val Glu Thr Gly Arg Ala Gly Arg Gln Glu Leu Ala Ala Val Asp
1045 1050 1055
Thr Ala Gly Leu Ala Gly Ile Val Asn Leu Leu Ala Leu Asp Glu Glu
1060 1065 1070
Pro His Pro Glu His Pro Ala Val Pro Ala Gly Leu Ala Ala Thr Thr
1075 1080 1085
Ala Leu Leu Gln Ala Leu Gly Asp Asn Gly Thr Thr Ala Pro Leu His
1090 1095 1100
Thr Val Thr Gln Gly Ala Val Ser Thr Gly Ala Thr Asp Pro Leu Thr
1105 1110 1115 1120
His Pro Leu Gln Ala His Val Trp Gly Leu Gly Arg Val Ala Ala Leu
1125 1130 1135
Glu His Pro Arg Leu Trp Ala Gly Leu Val Asp Leu Pro Ala Arg Ile
1140 1145 1150
Asp Arg His Thr Leu Pro Arg Leu Ala Ala Ala Leu Leu Pro Gln Asp
1155 1160 1165
Asp Glu Asp Gln Thr Ala Val Arg Pro Thr Gly Ile His His Arg Arg
1170 1175 1180
Leu Thr His Ala Val Gly Ser Ile Gln Asn Pro Val His Ser Glu Ala
1185 1190 1195 1200
Thr Trp Arg Pro Arg Gly Thr Thr Leu Ile Thr Gly Gly Thr Gly Gly
1205 1210 1215
Ile Gly Ala Val Leu Ala Arg Trp Leu Ala Arg Gln Gly Ala Pro Arg
1220 1225 1230
Leu His Leu Thr Ser Arg Arg Gly Pro Asp Ala Pro Gly Ala Arg Glu
1235 1240 1245
Leu Ala Ala Glu Leu Asp Gly Leu Gly Thr Ala Val Thr Ile Thr Ala
1250 1255 1260
Cys Asp Val Ser Asp Pro Arg Gln Leu Ser Gly Leu Ile Asp Asp Met
1265 1270 1275 1280
Pro Ala Glu His Pro Leu Thr Ala Val Ile His Ala Ala Gly Met Thr
1285 1290 1295
Asp Leu Thr Ala Ile Gly Asp Leu Thr Thr Ala Arg Leu Gly Glu Val
1300 1305 1310

Leu Gly Ser Lys Ser Asp Ala Ala Trp Asn Leu His Glu Leu Thr Arg
 1315 1320 1325
 Asp Leu Asp Leu Ser Ala Phe Val Met Phe Ser Ser Gly Ala Gly Val
 1330 1335 1340
 Trp Gly Ser Gly Gln Gln Gly Ala Tyr Gly Ala Ala Asn His Phe Leu
 1345 1350 1355 1360
 Asp Ala Leu Ala Glu His Arg Arg Ala Gln Gly Leu Pro Ala Thr Ser
 1365 1370 1375
 Ile Ala Trp Gly Pro Trp Ala Glu Ala Gly Met Ser Ala Asp Pro Glu
 1380 1385 1390
 Ser Leu Thr Tyr Phe Lys Arg Phe Gly Leu Leu Pro Ile Ala Pro Asp
 1395 1400 1405
 Leu Cys Val Lys Ala Leu His Gln Ala Val Asp Ala Gly Asp Ala Thr
 1410 1415 1420
 Leu Thr Val Ala Asn Phe Asp Trp Ala Lys Phe Thr Pro Thr Phe Thr
 1425 1430 1435 1440
 Ala Gln Arg Pro Ser Pro Phe Leu Asp Asp Leu Pro Glu Asn Gln Arg
 1445 1450 1455
 Glu Ala Glu Gln Thr Gly Thr Ala Ala Glu Thr Ser Ala Phe Arg Glu
 1460 1465 1470
 Glu Leu Ala Lys Thr Pro Ala Ser Gln Arg Leu Gly Phe Leu Val Gln
 1475 1480 1485
 Gln Val Arg Thr Tyr Ala Ala Ala Thr Leu Gly Arg Thr Val Glu Asp
 1490 1495 1500
 Ile Pro Ala Ala Lys Pro Phe Gln Glu Leu Gly Phe Asp Ser Leu Thr
 1505 1510 1515 1520
 Ala Val Gln Leu Arg Asn Gln Leu Asn Thr Thr Thr Gly Leu Ser Leu
 1525 1530 1535
 Pro Ala Thr Val Ile Phe Asp His Pro Thr Pro Glu Ala Leu Ala Thr
 1540 1545 1550
 His Leu Arg Gly Gln Leu Gly Asp Gly Ala Glu Val Ala Gly Glu Gly
 1555 1560 1565
 Asp Val Leu Ala Ala Leu Asp Lys Trp Asp Thr Ala Phe Gly Ala Ala
 1570 1575 1580
 Glu Val Asp Glu Ala Ala Arg Arg Arg Ile Val Gly Arg Leu Gln Val
 1585 1590 1595 1600
 Leu Val Ser Lys Trp Ser Pro Ala Gln Asp Gly Pro Glu Gly Thr Asp
 1605 1610 1615
 Ser Ala His Ala Asp Leu Glu Ala Ala Ser Ala Asp Asp Ile Phe Asp
 1620 1625 1630
 Leu Ile Ser Ser Glu Phe Gly Lys Ser
 1635 1640

<210> 31
 <211> 430
 <212> PRT
 <213> Streptomyces cinnamomensis

<400> 31

Val	Gly	Leu	Thr	Val	Gly	Pro	Asp	Asn	Ala	Lys	Arg	Gly	Ile	Val	Pro
1				5					10					15	
Ile	Thr	Asp	Ser	Lys	Pro	Ala	Ala	Thr	Phe	Pro	Asp	Leu	Val	Asp	Pro
			20					25					30		
Ser	Phe	Trp	Ala	Arg	Pro	His	Ala	Glu	Arg	Val	Ala	Leu	Phe	Glu	Glu
		35					40					45			
Met	Arg	Gly	Leu	Pro	Arg	Pro	Ala	Phe	Ile	Arg	Gln	Asn	Met	Pro	Gly
	50					55					60				
Val	Pro	Trp	Thr	Phe	Gly	Tyr	His	Ala	Leu	Val	Lys	Tyr	Ala	Asp	Ile
65					70					75					80
Val	Glu	Val	Ser	Arg	Arg	Pro	Gln	Asp	Phe	Ser	Ser	Asn	Gly	Ala	Thr
				85					90					95	
Thr	Ile	Ile	Gly	Leu	Pro	Pro	Glu	Leu	Asp	Glu	Tyr	Tyr	Gly	Ser	Met
			100					105					110		
Ile	Asn	Met	Asp	Asn	Pro	Glu	His	Ser	Arg	Leu	Arg	Arg	Ile	Val	Ser
		115					120					125			
Arg	Ser	Phe	Gly	Arg	Asn	Met	Ile	Pro	Glu	Phe	Glu	Ala	Val	Ala	Thr
	130					135					140				
Arg	Thr	Ala	Arg	Arg	Ile	Ile	Asp	Glu	Leu	Ile	Ala	Arg	Gly	Pro	Gly
145					150					155					160
Asp	Phe	Ile	Arg	Pro	Val	Ala	Ala	Glu	Met	Pro	Ile	Ala	Val	Leu	Ser
				165					170					175	
Asp	Met	Met	Gly	Ile	Pro	Ala	Glu	Asp	His	Asp	Phe	Leu	Phe	Asp	Arg
			180					185					190		
Ser	Asn	Thr	Ile	Val	Gly	Pro	Leu	Asp	Pro	Asp	Tyr	Val	Pro	Asp	Arg
		195					200					205			
Ala	Asp	Ser	Glu	Arg	Ala	Val	Ile	Glu	Ala	Ser	Arg	Glu	Leu	Gly	Asp
	210					215					220				
Tyr	Ile	Ala	Gly	Leu	Arg	Ala	Glu	Arg	Leu	Ala	Ala	Pro	Gly	Asn	Asp
225					230					235					240
Leu	Ile	Thr	Lys	Leu	Val	Gln	Val	Gln	Ala	Asp	Gly	Glu	Gln	Leu	Thr
			245					250						255	
Arg	Gln	Glu	Leu	Val	Ser	Phe	Phe	Ile	Leu	Leu	Val	Ile	Ala	Gly	Met
			260					265					270		
Glu	Thr	Thr	Arg	Asn	Ala	Ile	Ser	His	Ala	Leu	Val	Leu	Leu	Thr	Glu
		275					280					285			
His	Pro	Glu	Gln	Lys	Gln	Leu	Leu	Leu	Ser	Asp	Phe	Asp	Thr	His	Ala
	290					295					300				
Pro	Asn	Ala	Val	Glu	Glu	Ile	Leu	Arg	Val	Ser	Thr	Pro	Ile	Asn	Trp
305					310					315					320

Met Arg Arg Val Ala Thr Arg Asp Cys Asp Met Asn Gly His Arg Phe
325 330 335

Arg Arg Gly Asp Arg Ile Phe Leu Phe Tyr Trp Ser Gly Asn Arg Asp
340 345 350

Glu Ser Val Phe Pro Asp Pro Tyr Arg Phe Asp Ile Thr Arg Gly Thr
355 360 365

Asn Ala His Val Thr Phe Gly Ala Val Gly Pro His Val Cys Leu Gly
370 375 380

Ala His Leu Ala Arg Met Glu Ile Thr Val Leu Tyr Arg Glu Leu Leu
385 390 395 400

Ala Ala Leu Pro Gln Ile His Ala Val Gly Gln Pro Arg Arg Leu Asp
405 410 415

Ser Ser Phe Ile Glu Gly Ile Lys His Leu His Cys Ala Phe
420 425 430

<210> 32
<211> 267
<212> PRT
<213> Streptomyces cinnamomensis

<400> 32

Val Arg Tyr Glu Met Leu Gly Pro Leu Arg Ile Lys Asp Gly Asn Asp
1 5 10 15

Tyr Ala Thr Ile Asn Ala Gln Lys Val Glu Ile Val Leu Thr Val Leu
20 25 30

Leu Ile Arg Ala Asp Arg Val Val Ser Leu Glu Gln Leu Met Arg Glu
35 40 45

Ile Trp Gly Glu Asp Leu Pro Arg Arg Ala Thr Ala Gly Leu His Val
50 55 60

Tyr Ile Ser Gln Leu Arg Lys Phe Leu Lys Val Pro Gly Ser Ala Gly
65 70 75 80

Asn Pro Val Glu Thr Arg Ala Pro Gly Tyr Val Leu His Lys Arg Asp
85 90 95

Asp Asp Gln Ile Asp Ala Gln Ile Phe Pro Glu Leu Val Asp Val Gly
100 105 110

Arg Ser Leu Leu Arg Glu Lys Arg Phe Asp Glu Ala Ala Ser Cys Phe
115 120 125

Gly Gln Ala Leu Ala Leu Trp Arg Gly Pro Ile Leu Gly Gln Gly Gly
130 135 140

Asn Gly Pro Gly Thr Asn Gly Pro Ile Ile Asp Gly Phe Ser Thr Trp
145 150 155 160

Leu Thr Glu Ile Arg Leu Glu Cys Gln Glu Met Leu Val Glu Cys Gln
165 170 175

Leu Gln Leu Gly Arg His Arg Glu Ala Val Gly Met Leu Tyr Ala Leu
180 185 190

Thr Ala Glu Asn Pro Met Cys Glu Ala Phe Tyr Arg Gln Leu Met Leu
 195 200 205
 Ala Leu Tyr Arg Ser Glu Arg Gln Ala Asp Ala Leu Lys Val Tyr Gln
 210 215 220
 Ser Val Arg Lys Thr Leu Asn Asp Glu Leu Gly Leu Glu Pro Gly Arg
 225 230 235 240
 Pro Leu Gln Glu Leu Gln Arg Ala Ile Leu Ala Gly Asp Met His Leu
 245 250 255
 Met Ser Pro Pro Pro Leu Ala Leu Ser Gly Arg
 260 265

<210> 33
 <211> 277
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 33
 Leu Ser Ala Phe Leu Ala Lys Gly Lys Ile Leu Ser Ala Phe Pro Pro
 1 5 10 15
 Pro Asp Met Ser Asp Pro Trp Ile Arg Arg Phe Arg Pro Arg Pro Glu
 20 25 30
 Ala Val Val Arg Leu Val Cys Phe Pro His Ala Gly Gly Ser Ala Ser
 35 40 45
 Tyr Tyr His Pro Leu Ala Gln Ser Pro Thr Leu Pro Thr Asp Ser Glu
 50 55 60
 Val Leu Ala Val Gln Tyr Pro Gly Arg Gln Asp Arg Arg Arg Glu Arg
 65 70 75 80
 Leu Leu Asp Asp Ile Gly Glu Leu Ala Asp Leu Ile Thr Asp Ala Leu
 85 90 95
 Gly Pro Phe Asp Asp Arg Pro Leu Ala Phe Phe Gly His Ser Met Gly
 100 105 110
 Ala Val Leu Ala Tyr Glu Val Ala Gln Arg Leu Arg Glu Arg Thr Gly
 115 120 125
 Lys Gln Pro Cys Arg Leu Phe Val Ser Gly Arg Arg Ala Pro Ser Arg
 130 135 140
 Phe Arg Arg Gly Thr Val His Leu Leu Asp Asp Thr Glu Leu Ala Ala
 145 150 155 160
 Glu Leu Arg Arg Ala Gly Gly Thr Asp Pro Arg Phe Leu Asp Asp Glu
 165 170 175
 Glu Leu Leu Ala Glu Ile Ile Pro Val Val Arg Asn Asp Tyr Arg Ala
 180 185 190
 Val Glu Leu Tyr Arg Trp Asn Pro Ser Pro Pro Leu Ser Cys Pro Ile
 195 200 205
 Thr Ala Leu Val Gly Asp Arg Asp Pro Gln Ala Pro Leu Asp Glu Val
 210 215 220

Glu Ala Trp Gln Gln His Thr Glu Gly Pro Phe Asp Leu Lys Val Phe
225 230 235 240

Ala Gly Gly His Phe Tyr Leu Asn Thr His Gln Gln Gly Val Thr Glu
245 250 255

Val Ile Ser Lys Ala Leu Ala Asp Ser Ala Gln Gln Arg Ala Thr Ala
260 265 270

Arg Gly Asn Ala Arg
275

<210> 34

<211> 427

<212> PRT

<213> *Streptomyces cinnamomensis*

<400> 34

Leu Ala Asp Leu Val Ala His Ala Arg Ser Ala Ser Pro Tyr Tyr Arg
1 5 10 15

Glu Leu Tyr His Gly Leu Pro Glu Arg Ile Glu Asp Pro Thr Leu Leu
20 25 30

Pro Val Thr Asp Lys Lys Gln Leu Met Asp His Phe Asp Asp Trp Pro
35 40 45

Thr Asp Arg Asp Ile Thr Phe Glu Lys Val Arg Ala Phe Thr Asp Asp
50 55 60

Pro Glu Leu Ile Gly Arg Arg Phe Leu Gly Arg Tyr Leu Val Ala Thr
65 70 75 80

Thr Ser Gly Thr Ser Gly Arg Arg Gly Leu Phe Val Leu Asp Asp Arg
85 90 95

Tyr Met Asn Val Ser Ser Ala Val Ser Ser Arg Val Leu Ala Ser Trp
100 105 110

Leu Gly Pro Leu Gly Ile Ala Arg Ala Val Val His Gly Gly Arg Phe
115 120 125

Ala Gln Leu Val Ala Thr Glu Gly His Tyr Val Gly Phe Ala Gly Tyr
130 135 140

Ser Arg Leu Arg Gln Asp Gly Glu Ala Arg Ser Lys Leu Val Arg Ala
145 150 155 160

Phe Ser Val His Glu Pro Met Ser Arg Leu Val Ala Glu Leu Asn Glu
165 170 175

Tyr Arg Pro Ala Phe Val Ile Gly Tyr Ala Ser Thr Ile Met Leu Phe
180 185 190

Thr Ala Glu Gln Glu Ala Gly Arg Leu His Ile Asp Pro Val Leu Val
195 200 205

Glu Pro Ala Gly Glu Thr Met Thr Glu Ser Asp Thr Asp Arg Ile Ala
210 215 220

Ala Ala Phe Gly Ala Lys Val Arg Thr Met Tyr Ser Ala Thr Glu Cys
225 230 235 240

Thr Tyr Leu Ser His Gly Cys Ala Glu Gly Trp Tyr His Val Asn Asp
 245 250 255
 Asp Trp Ala Val Leu Glu Pro Val Asp Ala Asp His Arg Pro Thr Pro
 260 265 270
 Pro Gly Glu Phe Ser His Thr Thr Leu Ile Ser Asn Leu Ala Asn Arg
 275 280 285
 Val Gln Pro Phe Leu Arg Tyr Asp Leu Gly Asp Ser Val Met Leu Arg
 290 295 300
 Pro Asp Pro Cys Pro Cys Gly Thr Pro Ser Pro Ala Ile Arg Val Gln
 305 310 315 320
 Gly Arg Ser Gly Asp Ile Leu Thr Phe Pro Ser Gly Arg Gly Asp Asp
 325 330 335
 Val Ser Leu Ala Pro Leu Ala Phe Ser Ser Leu Phe Asp Arg Met Pro
 340 345 350
 Gly Val Glu Leu Phe Gln Ile Glu Gln Thr Ala Pro Ser Thr Leu Arg
 355 360 365
 Val Arg Val Val Gln Ala Pro Gly Ala Asp Ala Asp His Val Trp Gln
 370 375 380
 Arg Ala His Asp Gly Leu Thr His Leu Leu Ala Asp Asn Lys Leu Asp
 385 390 395 400
 Asn Val Thr Val Glu Arg Gly Glu Glu Pro Pro Arg Gln Ala Ser Gly
 405 410 415
 Gly Lys Tyr Arg Thr Ile Ile Pro Leu Ala Ala
 420 425

<210> 35
 <211> 338
 <212> PRT
 <213> Streptomyces cinnamomensis

<400> 35
 Val Lys Val Pro Val Glu Val Thr Val Arg Leu Ser Ser Trp Leu Gly
 1 5 10 15
 Gly Leu Val Ala Ala Val Leu Ala Ala Thr Val Leu Pro Ala Ser Ala
 20 25 30
 Ala Ser Ala Ala Asp Val Ser Ser Pro Pro Leu Glu Ile Pro Ala Ala
 35 40 45
 Glu Leu Ala Lys Ala Leu His Cys Gly Thr Glu Leu Gly Asp Leu Arg
 50 55 60
 Asp Ala Gly Asp Lys Pro Thr Val Leu Phe Val Pro Gly Thr Gly Leu
 65 70 75 80
 Lys Gly Glu Glu Asn Tyr Ala Trp Asn Tyr Met Ala Glu Leu Lys Lys
 85 90 95
 Lys Gly Tyr Gln Ser Cys Trp Val Asp Ser Pro Gly Arg Gly Leu Arg
 100 105 110

Asp Met Gln Glu Ser Val Glu Tyr Val Val Tyr Ala Thr Arg Ala Ile
 115 120 125
 Gln Glu Ala Thr Gly Arg Lys Val Asp Leu Val Gly His Ser Gln Gly
 130 135 140
 Gly Leu Leu Thr Ala Trp Ala Leu Arg Phe Trp Pro Asp Leu Pro Gly
 145 150 155 160
 Lys Val Asp Asp Met Val Thr Leu Gly Ser Pro Phe Gln Gly Thr Arg
 165 170 175
 Leu Ala Ser Pro Cys Arg Pro Ile Ala Glu Val Ala Gly Cys Pro Ala
 180 185 190
 Ser Val Leu Gln Phe Ala Arg Asp Ser Asn Trp Ser Lys Ala Leu Gly
 195 200 205
 Ala Asp Gly Thr Pro Met Pro Ala Gly Pro Ser Tyr Thr Thr Ile Tyr
 210 215 220
 Ser Tyr Ala Asp Glu Ser Val Val Ala Asp Gly Glu Ala Pro Ser Leu
 225 230 235 240
 Pro Gly Ala His Arg Ile Gly Val Gln Asp Ile Cys Pro Gly Arg Pro
 245 250 255
 Trp Pro Thr His Ile Ala Met Val Val Asp Gln Val Ser Tyr Asp Leu
 260 265 270
 Val Ala Asp Ala Ile Glu His Pro Gly Pro Ala Asp Thr Ser Arg Ile
 275 280 285
 Asp Arg Ala His Cys Ala Lys Pro Val Met Pro Leu Asn Ser Gln Glu
 290 295 300
 Ala Val Asp Ala Leu Pro Gly Leu Leu Asn Phe Pro Ile Glu Leu Leu
 305 310 315 320
 Ile His Ser Gln Pro Trp Val Asp Glu Glu Pro Pro Leu Arg Pro Tyr
 325 330 335

Ala Arg

<210> 36

<211> 308

<212> PRT

<213> *Streptomyces cinnamomensis*

<400> 36

Met Gly His Asp His Gly Pro Ser Ala Gly Ala Ala Gly Gly Thr Leu
 1 5 10 15
 Ser Gly Thr Tyr Arg Lys Arg Leu Leu Trp Thr Ile Gly Ile Ser Gly
 20 25 30
 Ser Ile Thr Val Ile Gln Val Val Gly Ala Leu Leu Ser Gly Ser Leu
 35 40 45
 Ala Leu Leu Ala Asp Ala Ala His Ser Leu Thr Asp Ala Val Gly Val
 50 55 60
 Ser Leu Ala Leu Gly Ala Ile Thr Leu Ala Gln Arg Ala Pro Thr Pro
 65 70 75 80

Arg Arg Thr Phe Gly Phe Cys Arg Val Glu Ile Phe Ser Ala Val Leu
 85 90 95
 Asn Ala Leu Leu Leu Val Val Ile Phe Ala Trp Val Leu Trp Ser Ala
 100 105 110
 Ile Gly Arg Phe Ser Glu Pro Val Glu Val Lys Gly Gly Leu Met Phe
 115 120 125
 Val Val Ala Leu Gly Gly Leu Ala Ala Asn Leu Val Gly Leu Trp Leu
 130 135 140
 Leu Arg Asp Ala Lys Glu Lys Ser Leu Asn Leu Arg Gly Ala Tyr Leu
 145 150 155 160
 Glu Val Leu Gly Asp Ala Leu Gly Ser Val Ala Val Ile Val Gly Gly
 165 170 175
 Leu Val Ile Leu Leu Thr Gly Trp Gln Ala Ala Asp Pro Ile Ala Ser
 180 185 190
 Ile Val Ile Gly Leu Leu Ile Val Pro Arg Ala Tyr Gly Leu Leu Arg
 195 200 205
 Asp Ser Leu His Val Leu Leu Glu Ala Thr Pro Gln Asp Val Asp Leu
 210 215 220
 Gly Glu Val Arg Arg His Leu Leu Glu Glu Arg Gly Val Val Ala Val
 225 230 235 240
 His Asp Leu His Gly Trp Thr Val Thr Ser Gly Met Pro Val Leu Thr
 245 250 255
 Ala His Val Val Val Thr Glu Glu Ala Leu Ala Ser Gly Tyr Gly Glu
 260 265 270
 Leu Leu Gly Arg Leu Gln Arg Cys Val Gly Gly His Phe Asp Val Ala
 275 280 285
 His Ser Thr Ile Gln Leu Glu Pro Glu Gly His Val Glu Glu Asp Gly
 290 295 300
 Ala Leu His Thr
 305

<210> 37
 <211> 363
 <212> PRT
 <213> Streptomyces cinnamonensis

<400> 37
 Met Thr Arg Ala Leu Thr Leu His Asp Trp Ile Val Ala Gly Ile Ala
 1 5 10 15
 Val Val Ala Gly Val Val Ala Gly Leu Leu Leu Arg Ala Leu Leu Arg
 20 25 30
 Trp Leu Gly Glu Arg Ala Ser Lys Thr Arg Trp Ser Gly Asp Asp Val
 35 40 45
 Ile Val Asp Ala Leu Arg Thr Leu Val Pro Cys Ala Ala Ile Thr Ala
 50 55 60

Gly Leu Ala Ala Ala Ala Gly Ala Leu Pro Leu Thr Pro Arg Thr Gly
 65 70 75 80
 Arg Asn Val Thr Met Thr Leu Thr Ala Leu Leu Ile Leu Ala Ala Thr
 85 90 95
 Leu Thr Ala Ala Arg Ile Val Thr Gly Leu Val Lys Ala Val Ala Gln
 100 105 110
 Ser Arg Ser Gly Val Ala Gly Ser Ala Thr Ile Phe Val Asn Ile Thr
 115 120 125
 Arg Val Val Val Leu Ala Met Gly Phe Leu Ile Val Leu Gln Thr Leu
 130 135 140
 Gly Ile Ser Ile Ala Pro Leu Leu Thr Ala Leu Gly Val Gly Gly Leu
 145 150 155 160
 Ala Val Ala Leu Ala Leu Gln Asp Thr Leu Ala Asn Leu Phe Ala Gly
 165 170 175
 Val His Ile Leu Ala Ala Lys Thr Val Gln Pro Gly Asp Tyr Ile Gln
 180 185 190
 Leu Ser Ser Gly Glu Glu Gly Tyr Val Val Asp Ile Asn Trp Arg Asn
 195 200 205
 Thr Thr Val Arg Gln Leu Ser Asn Asn Leu Val Ile Ile Pro Asn Ala
 210 215 220
 Lys Leu Ala Gly Thr Asn Met Thr Asn Tyr Ser Arg Pro Glu Gln Glu
 225 230 235 240
 Leu Ser Ile Met Val Gln Val Gly Val Ser Tyr Asp Ser Asp Leu Glu
 245 250 255
 Gln Val Glu Lys Val Thr Thr Glu Val Val Asp Glu Val Met Ala Glu
 260 265 270
 Ile Thr Gly Ala Val Pro Asp His Glu Ala Ala Ile Arg Phe His Thr
 275 280 285
 Phe Gly Asp Ser Arg Ile Ser Phe Thr Val Ile Leu Gly Val Gly Glu
 290 295 300
 Phe Ser Asp Gln Tyr Arg Ile Lys His Glu Phe Ile Lys Arg Leu His
 305 310 315 320
 Gln Arg Tyr Arg Ala Glu Gly Ile Arg Val Pro Ala Pro Val Arg Thr
 325 330 335
 Val Arg Val Gln Gln Gly Glu Leu Pro Pro Leu Gly Ile Pro His
 340 345 350
 Gln Arg Asp Thr Ser Thr Gln Ala Arg Leu His
 355 360

<210> 38

<211> 131

<212> PRT

<213> *Streptomyces cinnamonensis*

<400> 38
Met Ser Pro Val Asn Ser His Asn Glu Trp Asp Pro Leu Glu Glu Ile
1 5 10 15
Ile Val Gly Arg Leu Glu Gly Ala Thr Ile Pro Ser Ser His Pro Val
20 25 30
Val Ala Cys Asn Ile Pro Thr Trp Ala Ala Arg Leu Gln Gly Leu Ala
35 40 45
Ala Gly Phe Glu Tyr Pro Gln Arg Leu Ile Glu Pro Ala Gln Gln Glu
50 55 60
Leu Asp Gln Phe Ile Ala Leu Leu Gln Ser Leu Asp Val Thr Val Arg
65 70 75 80
Arg Pro Ala Ala Val Asp His Lys His Arg Phe Gly Thr Pro Asp Trp
85 90 95
Gln Ser Arg Gly Phe Cys Asn Ser Cys Pro Arg Asp Ser Met Leu Val
100 105 110
Val Gly Asp Glu Ile Ile Glu Thr Pro Met Ala Trp Pro Cys Arg Cys
115 120 125
Phe Glu Thr
130

<210> 39
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 39
ccactagtat gcatgcgagt gtccgttcga gt 32

<210> 40
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 40
ttgtatacac ctaggatggt tggccgtgc 29

<210> 41
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 41
agataccata tgctgggccc gctccgcat 29

<210> 42
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 42
 aatgctctag actgtcagcg accggacagg gccaa 35

 <210> 43
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 43
 ggtggccacg gaaacaccaa caccggaccc gcgcc 35

 <210> 44
 <211> 29
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 44
 ctctcggagg cccggcgcaa cggccacaa 29

 <210> 45
 <211> 34
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 45
 ggccctagggc tgccctcgggt ggtggatctg ccga 34

 <210> 46
 <211> 27
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 46
 tggtcgggcg cgggtgcgtgc gatacgt 27

 <210> 47
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

 <400> 47
 cctggccagg gcggccagtg ggtgggcatg 30

 <210> 48
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 48
 ggcctagggg tcggccggga accagcgccg ccagt 35

 <210> 49
 <211> 31
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 49
 gtgacgtcat atgtcgagtg ctgaagagtc g 31

 <210> 50
 <211> 32
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 50
 ggggtcgcct aggaaccagc gccgccagtc ga 32

 <210> 51
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 51
 cggcctcgag ggcccgtcgg tcagtgtcga caggcgcag tcctcctcgc 50

 <210> 52
 <211> 32
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 52
 ggggtcgcct aggaaccagc gccgccagtc ga 32